THE

ANTHROPOLOGICAL REVIEW.

No. XXV.

APRIL, 1869.

THE CAVE CANNIBALS OF SOUTH AFRICA.

By James Henry Bowker, Dr. Bleek, and Dr. John Beddoe.

Amongst the many interesting objects of the Transgariep country are the celebrated Cannibal Caverns, the largest of which is situated amongst the mountains beyond Thaba Bosigo. A visit to this cavern will well repay the traveller for the break-neck journey that he is obliged to take before reaching it; and after he has spent an hour or two in the cavern and its vicinity, he will, I imagine, return a wiser and a sadder man; for such were the feelings that I brought away with me after paying it a visit.

We left Thaba Bosigo (the residence of the old Chief Moshesh) in the morning, and after passing that mountain, we travelled up a steep and narrow valley, and then along the Berea heights, until we reached the old deserted mission station Cana, where having obtained the necessary guides amongst the natives of this place, we started for the Cannibal Cavern, which was about two miles distant. Upon our arrival at the mountain above the cavern we left our horses in charge of a native, and descended a steep and rugged foot-path (or rather I should have said, a *hand*-and-foot-path, for the hands have quite as much to do in travelling this precipitous path as the feet), and by dint of holding on to tufts of grass, shrubs, projecting rocks, &c., &c., and by slipping, sliding, and scrambling, we at length arrived upon a grassy ledge, in the face of the cliff, where we could stand without the necessity of holding on. On turning to the right of this ledge the scene opened out in all its grandeur; and certainly, in all my life and wanderings, I have never beheld a more savage looking place. The cavern is formed by the overhanging cliff, and its entrance, a long, rugged, natural arch, extends along the whole face of the cavern, or nearly so, which is in length about one hundred and thirty yards, and its breadth about one hundred. The roof of this place, which is lofty and arched, is blackened with the smoke and soot of the fires of the savages who

formerly inhabited it, and its floor, strewn with the remains of what they had left there, consisted of heaps of human bones, piled up together or scattered about at random in the cavern, and from thence, down the sloping face of the rock, as far as the eye could reach, the clefts and small level spots were white with the bones and skulls of human beings; skulls especially were very numerous, and consisted chiefly of those of children and young persons. These remains told too true a tale of the purpose for which they had been used, for they were hacked and cut to pieces with what appeared to have been either blunt axes or sharpened stones; the marrow-bones were split into small pieces, the rounded joints alone being left unbroken. Only a very few of these bones were charred by fire, showing that the prevailing taste had been for boiled rather than roast meat.

You may guess the feelings with which I wandered about this gloomy sepulchre, and examined its various places of interest. One spot was pointed out to me, with rough irregular steps, leading up into the interior of the cavern to a gloomy-looking natural gallery, and in this place, I was informed, were stowed away the unfortunate victims not required for immediate consumption. From this place it was impossible to escape without passing through the middle of the cavern, which they could not do without being detected.

Horrible as all this must appear, there might be some excuse made for savages, driven by famine to extreme hunger, for capturing and devouring their enemies; but with these people it was totally different, for they were inhabiting a fine agricultural tract of country, which also abounded in game; but, notwithstanding all this, they were not contented with hunting and feeding upon their enemies, but preyed much upon each other also, for many of their captures were made from amongst the people of their own tribe, and even worse than this, in times of scarcity, many of their own wives and children became the victims of this horrible practice. If a wife proved lazy, or quarrelsome, she was speedily disposed of; or a crying baby would in like manner be silenced, and any member of the community showing signs of sickness, or bodily infirmity, would not be allowed to linger or to fall off in condition. Such were the horrible practices of this degraded people, and although it is now commonly reported that they have for many years entirely given up this diabolical way of living, I saw, while at the cavern, unmistakable evidence that the custom has not been altogether abandoned, for amongst the numerous bones were a few that appeared very recent; they were apparently those of a tall, bony individual, with a skull as hard as bronze; in the joints of these bones the marrow and fatty substances were still evident, showing but too plainly that not many months had elapsed since he had met his fate.

This cavern is one of the largest in the country, and from all accounts formed one of the head-quarter establishments of the cannibals; but the whole country, from the Moluta to the Caledon, including a part of the Putesana River, was, about thirty years ago, inhabited by cannibals, who were the terror of the surrounding tribes.

Their mode of living was to send out hunting parties who would conceal themselves amongst the rocks and bushes, and lie in ambush near roads, drifts, gardens, or watering places, for the purpose of surprising and capturing women and children, or travellers, or boys in search of lost cattle, &c.

There are still a good many of the old cannibals in existence. On the day that we visited the cavern, I was introduced to one of them, who is now living not very far from his former dwelling-place. He is a man of about sixty years of age, and (not to speak from prejudice) one of the most God-lost looking ruffians that I have ever beheld in all my life. There is one little episode connected with his life that I may as well relate. In former days, when he was a young man, and residing in the cavern, he captured, during one of his hunting expeditions, three young women, and from these he selected the best looking as a partner for life—the other two went to stock the larder. This union, notwithstanding the strange circumstances attending it, proved to be a happy one, the lady soon reconciling herself to her new mode of living, and settling quietly down in the cavern, where I was shown the corner which she and her husband formerly occupied; and her son, a fine strapping youth, brought us some milk on the day on which we visited the caverns. The old man's name is Rankutsent,* and that of his wife Mategyeni.

Of the vegetation of the cavern and its vicinity, I have but little to say. There was nothing remarkable about it; a few scattered ferns of the commonest kinds grew here and there in the crevices of its roof, and outside of the cavern, growing in the broken skull of a child, which was partly filled with earth and served it as a flower-pot, was a little bulb (one of *Asphodelaceæ*), which I brought away with me as a souvenir of the cavern and its sad associations.

I also visited, in company with some friends, several of the cannibal caverns near the sources of the Caledon River. Some of these are very fine large caverns, though not so extensive as the one that I have just described. These Caledon River caverns are still inhabited, though no

* This is probably *Rakotsuane*, whom Arbousset and Dumas mention as the principal chief of the cannibal tribe, called *Makhatla*, tributaries to Moshesh. According to Arbousset's original account (*Relation*, p. 117), *Rakotsuane* had four kraals under him, whilst the translation (*Narrative*, p. 58) makes him govern twenty-five or twenty-six kraals, the most considerable of which was *Sefika*.

longer by cannibals, as the people have taken to other modes of procuring a livelihood.

At one of these caverns we met with an old savage, who told us that he had formerly been at the cooking of about thirty people, when cannibalism was still in vogue, and he seemed, like the "Last Minstrel," greatly to regret that

> "Old times were changed,
> Old manners gone;"

and that

> "The bigots of this iron time
> Had called his *harmless* life a crime."

for he appeared to think that the objections raised to their former mode of living were unreasonable and uncalled-for. This old savage had a "devilled kidney," or "boiled missionary," look about him.

While we were at this place we heard rather a curious anecdote; it is as follows:—

Many years ago, during one of the raids made by the cannibals, several individuals were captured and brought into the cavern, and amongst them was a young girl of great personal attractions. After a great deal of discussion on the part of the savages, her life was spared, and she became the wife of one of the cannibals. After some time had elapsed the father of this girl received information that she was still alive, but detained in the cavern; upon hearing which he sought the aid of one of the missionaries residing in those regions, and together they proceeded to the cavern, where they made the necessary arrangements for the girl's return to her home, the father paying six oxen as ransom for his daughter. But she had not been very long at home before she again disappeared, and, upon inquiry being made, it was found that she had, of her own free will, returned to her friends in the cavern; strange to say, preferring their mode of living to that of her father, who was not a cannibal.

There is another anecdote told of these people, which I will also relate, as it serves to illustrate their manners and customs, and to show how lightly they regarded human life:—

In former times, when lions were plentiful in these regions, they would occasionally (like the inhabitants of the caverns) choose the flesh of human game in preference to that of wild animals, becoming exceedingly troublesome in their nightly ravages to the inhabitants of the caverns, seizing and devouring many of them. To rid themselves of the lions, these people constructed stone-traps, and (shocking to relate) these stone-traps were baited with young children, whose sad wailings attracted the lions to the spot, when they would be taken in the snare, and the life of the child sacrificed. There is an old woman living near Thaba Bosigo who told me that she had, in the days of her

childhood, been the bait of a lion-trap; fortunately for her the lions did not enter the trap in which she was placed, or she would not have been saved to tell the tale.

The inhabitants of these caverns, who were formerly cannibals, constitute a part of Moshesh's tribe, which has been made up of the remnants of various aboriginal nations. The old chief, I have heard, did all in his power to suppress and do away with cannibalism amongst his people, and his endeavours were at length crowned with success, for they have, almost without exception, ceased to practise this inhuman custom, and have taken to other and more civilised modes of obtaining a livelihood. They are now not only stock-breeders, as well as stock-lifters, but they are also tillers of the soil.

DR. BLEEK HAS KINDLY ADDED THE FOLLOWING.

Those whom it may interest to hear more of the history of this cannibalism, we refer particularly to *Arbousset et Daumas' Relation d'un Voyage d'exploration au Nord-est de la Colonie du Cap de Bonne-Espérance; entrepris dans les mois de mars, avril et mai* 1836 (Paris 1842), chap. VII, pp. 105-123. In the English translation by our late colonial botanist, Dr. Brown (Cape Town, 1846), this chapter is at pp. 52-61; but the translation does not contain the plates of the original edition, among which there are two (facing pp. 106 and 110) portraying the cannibal Betshuana. In the map which accompanies the original edition we find the seats of these cannibals laid down to the north-east of Thaba Bosigo. A short account of them is also given in the Rev. Edward Solomon's *Two Lectures on the Native Tribes of the Interior* (Cape Town, 1855), pp. 62-64.

According to the latter writer, the tribes who practised cannibalism were four, of whom two were Betshuana (the *Bafukeng* or *Ba-hukeng* and *Ma-katla*), and two Kafir, viz., the *Ba-makakana* and the *Bamatlapatlapa*. It appears as if these tribes had first become cannibals through the wars which devastated those parts of Africa nearly fifty years ago. There is no doubt, however, that when once the appetite for human flesh had been created, they did not abandon the use of this kind of food, even after the necessity had ceased; and cannibalism became the habit of a people who (as our reporter had observed) inhabited "a fine agricultural country, which also abounded with game." It is possible, however, that cannibalism is of far older date in these regions. The native literature of the Zulus and the Betshuana abounds with reference to the cannibals who are called *A-ma-zimu* (sing. *I-zimu*) in Zulu, and *Ma-rimo* (sing. *Le-rimo*) in Setshuana. In several of the interesting Zulu nursery tales, published by Dr. Callaway, the cannibals play as prominent a part as the giants and man-eating witches in our European nursery tales. How deliciously, it is

told, how Unhlakanyana, entrapped by the cannibals, makes them eat their own mother instead of himself. Another story is remarkable, because it is met with not only among the Zulu, but is also told in essentially the same manner by the Betshuâna tribes. It is the tale of "The Girl and the Cannibals," on pp. 142-152 of Dr. Callaway's *Nursery Tales;* and another Zulu version of it appears to be *Usitungu sonbenhle*, on pp. 74-78. Arbousset recounts it under the title *Tsélané*, at pp. 119-123 of his *Relation* (pp. 59-61 of Dr. Brown's Translation). The Setlapi version differs somewhat both from the Sesuto and the Zulu. It was written down from the dictation of a native called Mahube, by the late Rev. J. Frédoux (Motito, Dec. 13th, 1865), and is preserved in manuscript at the Grey Library.

The following is a general account of the *Amazimu*, or cannibals, as dictated in Zulu to Dr. Callaway by a native (*Nursery Tales*, pp. 155-158):—

"All I know is that it is said that the Amazimu deserted other men and went to live in the mountains. For at first the Amazimu were men. The country was desolate; there was a great famine; and they wished to eat men because of the severity of the famine. When the famine was great, and men were in want, and there was no place where they could obtain food, they began to lay hold of men and to eat them. And so they were called Amazimu; for the word Amazimu, when interpreted, means to gormandize—to be gluttonous. So they rebelled against men; they forsook them and liked to eat them; and men drove them away. They went everywhere seeking men for food, and so they were regarded as a distinct nation, for with them men became game. They no longer cultivated the soil; they no longer had cattle or houses or sheep, nor any of those things which they had had whilst they were men. They went and lived in dens. When they found a cave, it became their dwelling-place whilst they went to hunt men. If they caught a man they went to the cave; again they left it to go and hunt men. They had no fixed habitation. If they did not catch a man they were constantly on the move, going about hunting for men.

"If they saw a man going alone they went to him, they decoyed him, and made themselves out merciful people; they treated him kindly, and spoke gently with him; and appeared incapable of doing any evil. When the man was thus beguiled and entirely unsuspicious, regarding them as pleasant people only, they would then lay hold of him; if he was a powerful man he might fight with them, and perhaps drive them off; or they might overcome him and carry him away to eat him. Again they hunted; at all times their occupation was to hunt.

"When they saw many men perhaps the men recognised them, and when they saw the Amazimu coming to them they began to prepare their weapons; if the Amazimu were numerous they threw themselves into line, and the men, too, threw themselves into line, forming a row. Then they drew near to each other, the Amazimu, too, drawing near;

but the men drew near with great courage, (that is, it required very great courage to think of fighting them,) for they knew that the Amazimu were very powerful men and fought. Perhaps they fight, perhaps they do not fight; but the men run away on casting one glance at them, for the Amazimu were terrible. Some who are brave may fight with them, and perhaps beat them; they then run away and leave the men behind, for the Amazimu were very swift; and the men can do nothing, and give over the pursuit.

"Again the Amazimu hunt and fall in with other men: when they fall in with them, perhaps they see that they are Amazimu, and run away, and the Amazimu pursue them until they overtake them; when they overtake them they lay hold of them. Others hide themselves and they do not see them. If they have caught sight of a man who has not hid himself he must run a great distance, they pursuing him till he is tired. For if a man does not hide himself, but contends with them by running only, they pursue him till they overtake him, for they do not readily tire. Then they carry him away with them, seeking a place concealed from men in the wilderness; when they come to such a place they boil and eat him."

Dr. Callaway errs, however, in believing that the tales of cannibals in South Africa "are, for the most part, the traditional record of the incursions of foreign slave-hunters." If Dr. Callaway had seen the caves of the cannibals, he would hardly have doubted that the reports of the natives and the French missionaries were as literally true as could be expected under the circumstances. The long-haired cannibals are evidently Betshuana, who generally have or wear longer hair than the Kafir tribes.

Further Particulars respecting the Cannibals of South Africa.

By Dr. John Beddoe.

An Englishman, who visited the Cannibal Caves in December 1868, says, there is a regular system of chopping up the bodies, just as a butcher does a sheep. Every skull is cut with an axe across the bridge of the nose, cutting away the jaws, which are thrown away; a hole is then cut in the top of the skull, and the brains taken out. The ribs are all cut through to go into the cooking-pots, the large bones divided, and the marrow taken out. Many bones have gristle still adhering; and there are marks of the knives on the skulls where the flesh has been cut off, in strips, to eat. The bodies of the Europeans who fell in the attack on Thaba Bosigo were eaten at once, under the belief that their courage would pass into the bodies of their devourers.

A Basuto, who lately took service with a colonist near Graham's Town, stated, that the cannibals always ate white people, and blacks of other tribes: but not Hottentots or half-breeds. They ate the heart, liver, etc., took out the brains, tied them in a rag, and baked

them under ashes,—this is in good seasons; in times of greater scarcity they devour the whole body. They ate all the white people who fell into their hands during the late war in the Free State.

When questioned on the subject by the Kaffir servants of the colonist,* the same Basuto said he had never eaten human flesh himself, but he owned to having seen others do so, and he knew all about it.

ON MICROCEPHALI; OR, HUMAN-APE ORGANISMS.†

By Professor CARL VOGT, Hon. F.A.S.L.

I PURPOSE in this memoir to treat of certain cases of idiotism, happily very rare, which are the result of a congenital insufficiency of the cerebral system, and which should be distinguished from such cases of idiotism as are produced by various maladies after birth.

The intellectual faculties may be more or less profoundly altered by a number of different causes. They may be disturbed momentarily, or for a more or less considerable length of time, or even through life, by acute or chronic attacks. They may even be almost entirely abolished by morbid causes, leaving pathological alterations, differing much in their nature, but resembling each other in their effects. We now know that the primary causes of these states of brutalisation, known by the names of idiotism or cretinism, may vary; that cretinism may be combined with thousand deformations, differing much from each other, of the osseous cranium, of the integuments and of the substance of the brain; that effusions, extravasation of blood, inflammations, partial or general dropsy, may induce similar effects as regards the intellectual life of the brain, and that these morbid states may anatomically be manifested by a number of frequently opposite alterations.

I do not intend to enter into the analysis of all these cases, which are the result of morbid conditions supervening in an originally normally constituted organ. I shall only treat of cases of microcephaly, properly so called; where, by an arrest of development—which supervened during the uterine life of the fœtus, and by causes as yet unknown—the brain of the embryo is struck before being definitively

* Who was my informant.—J. B.

† We propose to publish, in a series of articles, a translation of the greater part of the important Memoir which M. Vogt has recently published on the above subject. We are glad to announce that we do so with the author's sanction and cooperation.—EDITOR.

constituted, and where, consequently, the infant is born with a brain considerably less in volume, and profoundly modified in its essential forms. I also exclude monsters not viable, because of the greater or lesser deficiency of the brain; acephalous monsters, and anencephali (without brain). I confine myself to human products who are viable, and *who have lived*, in whom has been observed, from their birth, a brain too small, and a small cranium moulded on a defective brain.

Apart from any other quality of form or structure, the cerebral mass, in the genus *homo*, ought to have a minimum of volume and weight, below which it cannot descend without the cerebral functions, and, in the first place, those of the intelligence becoming sensibly affected. Microcephaly constitutes, as the Greek word justly expresses it, that condition in which the cranium, and the brain contained in it, have not reached the limit assigned to the species, and in which already, before birth, the cerebral functions are disturbed in consequence of arrest of development.

Cases of microcephaly are, I repeat, rare. The crania and the brain of microcephali are the most valuable objects in pathological collections. Despite long continued researches, I have, in the whole scientific literature, only found notices of about forty cases, and even of these there are, probably, some belonging to the category of idiotism from disease. I shall only mention the cases which I could not examine myself, by citing the sources I have taken them from. I shall, however, treat, in detail, of the crania and casts of the brain, which have kindly been placed at my disposal by the directors of the respective museums to which they belonged. Owing to the liberality of Messrs. Henle, of Goettingen; Reichert and Virchow, of Berlin; Luschka, of Tubingen; Welcker, of Halle; Koellicker and Recklingshausen, of Wurzburg; Graeser, of Eichberg (Nassau); Krauss, of Stuttgard, I have been enabled to present—at the sitting of the Natural History Section of the Genève Institute, June 6, 1866—nine well characterised crania of microcephali, which form pretty nearly the whole inventory of Germany, as regards this formation. I am also indebted for many particulars, and pieces for comparison, to Messrs. Ecker, of Freiburg; Frey, of Zurich; Theile, of Weimar; Capellini, of Bologna; Klebs, of Berne; Dr. Schaerer, of Waldau; De la Harpe, of Lausanne; Broca and Quatrefages, of Paris: to all of whom I return sincere thanks.

In this first memoir, I only give the particulars of German microcephali, for the history of which I was enabled to collect all the materials, excepting two brains preserved in alcohol. I shall, in supplements, treat of such, the materials for which are as yet incomplete. There seems to hover an evil star over all the materials formerly col-

lected at Paris. Despite the researches of my friend, M. Broca, none of the objects examined by MM. Cruveilhier, Baillarger, and Gratiolet, have been discovered,—a fact the more to be regretted, as the collection contained the only known cranium of a Negro microcephalus.

As I had no brains at my disposal I was obliged to confine my researches to crania and casts of the cranial cavity. I have given the *contours* of all the objects in natural size in geometrical projection. Some of the figures have been drawn with the apparatus of Lucae; but for the great majority of the objects I have used the diagraph of Gavard of Paris, an excellent instrument, not less exact than that of Lucae, and more easy in application for the designer.

All my drawings, excepting two views of the bases of crania, are taken upon a uniform position of the cranium, in which the superior margin, or the axis of the zygomatic arch, is parallel to the horizontal plane. It is known that this plane has been adopted by the Anthropologists who met at Goettingen, and in the works of MM. Ecker, Lucae, His, Rutimeyer, as well as in my own work on Man. I have reduced to the same position the drawings of the casts of the internal cavity representing the brain, in the conviction that the contents should be seen in the same manner as the capsule. The crania and the casts, being all drawn in natural size, may easily be compared with each other, by superposing the traces upon tracing paper. But here we must explain the mode of superposing these traces. I place the traces of the profile in such a manner that the median points of the naso-frontal suture exactly cover each other, and I reduce in the view of the profile the zygomatic arch to the horizontal plane. The differences in the *contours* are then seen at once, and are much more easily understood than by long descriptions. The division of my work was indicated by the nature of my subject. I first treat of the microcephali which have become known to me, citing all the sources where notices of them may be found, as well as the museums containing the preparations.

I then proceed to a detailed description of these pieces, reporting at the same time textually, as far as I had access to these documents, all that the respective authors said on these cases. I should have wished to separate, in order to insert them at a more appropriate place, the notices on the cranium and the brain, from the intellectual manifestations and the biography of these beings; but, to my regret, this was not always possible. I have, therefore, in the first chapter reported all that appeared to me important, confining my own observations to the cranium alone. I thus pass in review first the adults, and then infant microcephali, and summarise the facts in separate articles. I finish this chapter by a general summary on the conformation of

crania, treating especially of prognathism and of the position of the great occipital foramen.

In the second chapter I proceed to the examination of the brain by the aid of internal casts of the cerebral cavity. I examine the volume, the relation of the different parts and lobes, the convolutions and the relations of certain parts to some localised faculties.

The third chapter is devoted to the study of the manifestation of life, both somatic and intellectual. Amongst the cases will be found one of a microcephalous girl still living in the Canton of Berne.

The fourth chapter finally contains some general remarks on the causes of microcephaly, its relations to normal conformations, and on the results obtained for science in general, and the theory of Darwin in particular.

List of known Microcephali, the Authors who have described them, and the Museums in which the Preparations are preserved.

(*a*) Germany.

1. Gottfried Maehre, of Ratzum, died aged 44 years; Tables I-IV. The entire cranium is in the Museum of Halle.
   J. G. Carus, Atlas der Cranioscopie, Tab. IV, 1843.
   Hermann Welcker, Untersuchungen über Wachsthum und Bau des Menschlichen Schaedels, 1862. Some measurements of this cranium as well as of No. 4.
2. Michael Sohn, of Kiwittsblott, near Bromberg, died aged 20 years. Plates 5-7.
3. Friederich Sohn, his brother, died aged 18? Pl. 8-10. The entire skeleton of the former, and the cranium of the latter, are in the Berlin Museum.
   Johannes Müller, Nachrichten über die beiden Mikrocephalen zu Kiwittsblott bei Bromberg in Medicinische Zeitschrift für Heilkunde in Preussen, 1836, Nos. 2 and 3.
4. Conrad Schuettelndreyer, of Buckeburg, died aged 31. Pl. 11-13. The cranium is in the Museum of Goettingen.
   Blumenbach, De anomalis et vitiosis quibusdam nisus formationis aberrationibus. 1813.
   Foerster, Atlas der Missbildungen: Handbuch der speziellen Pathologischen Anatomie, 1834, p. 406, pl. 17.
5. Microcephalus, of Jena, died aged 26. Pl. 14-16. The cranium and the brain are in the Goettingen Museum.
   Theile, Ueber einen Microcephalus in Zeitschrift für rationelle Medicin, von Henle und Pfeufer. Third series, vol. xi, p. 210, 1861.

6. Louis Racke, of Hofheim (Nassau), died aged 20. Pl. 17 and 18. The cranium is in the Museum of the Hospital at Eichberg, near Eltville (Nassau).
7. Margareta Maehler, of Reineck, died aged 33. Pl. 19-21. The cranium is in the Museum of Würzburg.

   Virchow, Gesammelte Abhandlungen zur wissenschaftliche Medicin, 1856, p. 947.

   O. Schröder, Krankengeschichte und Sectionsbericht in Archiv für wissenschaftliche Medicin, von Virchow, vol. xx, p. 358.

   Foerster. See No. 4.
8. Johann Moegle, of Plattenhardt, near Stuttgard, died aged 15. Pl. 22, 23. The cranium is in the Tübingen Museum, No. 14.
9. Jacob Moegle, the cousin of the preceding, died aged 10. Pl. 24-26. The cranium is in the Stuttgard Museum, No. 13.
10. Johann George Moegle, brother of the preceding, died aged 5. Pl. 25, 26. The cranium is in the Tübingen Museum, No. 12.

    Jaeger, Zur Geschichte hirnarmer Kinder: Medicinisches Correspondenzblatt des Würtembergischen aerztlichen Vereins, vol. ix, 1839, No. 28.

(*b*) FRANCE.

11, 12, 13. Three cases mentioned in Cruveilhier, Anatomie Pathologique, liv. 30, pl. 4.

14. A case described by Blachez in Bulletin de la Société Anatomique de Paris. 2me série, vol. i, Juillet 1856.
15. Case of 4 years; cranium and brain confided by M. Giraldes to M. Gratiolet.

    Gratiolet, Observations sur la Microcéphalie, in Bulletins de la Société d'Anthropologie de Paris, vol. i, p. 34.

    Gratiolet, *ibid.*, vol. ii, p. 68.

    Gratiolet et Leuret, Anatomie comparée du Système Nerveux. Atlas, pl. 24.
16. Another case of 4 years. Cranium and brain given by M. Giraldes to M. Gratiolet.

    Gratiolet et Leuret, Anatomie comparée du Système Nerveux. Atlas, pl. 32.

    Gratiolet, Observations sur la Microcéphalie, in Bulletins de la Société d'Anthropologie de Paris, vol. i, p. 34.
17. Case presented by M. Broca to the Anthropological Society of Paris.
18. Girl, aged 4 years, presented by M. Baillarger before the Académie de Médecine.

    Annales Médico-psychologiques, par Baillarger: Cerise et Moreau, 3me série, tome 2me, p. 473, 1856.
19. Boy, two years of age, observed by M. Joly, mentioned by M. Baillarger in the same note, p. 471.

(*c*) ENGLAND.

20. Cranium, preserved in the College of Surgeons. Male.
Owen, Osteology of the Chimpanzee,—Transactions of the Zoological Society, vol. i, p. 343.

21, 22. Two crania and brains, in the Museum of St. Bartholomew's Hospital. Described in the Catalogue of that Museum.

23. Case of a female, aged 42 years.
Gore, Notice of a case of Microcephaly, in Anthropological Review, vol. i, p. 169.
Defert, Rapport sur la Notice de M. Gore, Bulletins de la Société Anthropologique de Paris, vol. v, p. 15.

24, 25. Two cases, boy aged 11, and girl aged 7 years. Conolly. Dublin Quarterly Journal, August 1865.

26. One case. Peacock, Notes on a case of Congenital Atrophy of the Brain, and Idiotcy, in Reports of the Pathological Society of London, vol. x, session 1858-1859.

27. One case. Willis, Cerebri Anatome. Genève, 1860, p. 20.

28. Young girl, of Cork. Cranium preserved in the Museum of the College of Surgeons.
Spurzheim, Anatomy of the Brain. London, 1826.

29. Brain of a boy aged 12, presented by Mr. Marshall. Marshall, Anthropological Review, vol. i, p. 8, May 12, 1863.
Defert, Rapport sur la Revue Anthropologique de Londres, in Bulletins de la Société d'Anthropologie de Paris, vol. v, p. 560.
At the meeting of the Anthropological Society of London, May 1, 1866, Dr. Down observed that there were many cases of living Microcephali of a very low organisation. Dr. Beigel added, that he had seen fifteen of them at Colney Hatch.—Journal of the Anthropological Society, No. 15, October 1866, p. 182.

(*d*) HOLLAND.

30. Cranium, preserved in the Museum of Leyden, the individual died at the age of 20.
Sandifort, Museum Anatomicum Academiæ Lugduni Batavorum, vol. iv, Tab. 690-691.

(*e*) SWITZERLAND.

31. A boy, aged 9 years, died at Abendberg, near Interlaken.
Vrolik, Beschrijwing van gebrekkigen Hersen-en Schedel-Vorm. Amsterdam, 1854.

32-34. Three cases, among five infants, at St. Leonard, near Sion.
Baillarger, Annales Médico-Psychologiques, 3me série, vol. ii, p. 460.

35. A. R., girl, aged 5, died at Abendberg, near Interlaken. Autopsy by Professor Valentin of Berne, in
J. Guggenbühl, Die Heilung und Verhütung des Cretinismus und ihre neuesten Fortschritte, Bern und St. Gallen, 1853, p. 56.

36. Marie-Sophie Wyss, aged 16 years. Still living, in the hospice for poor and sick females, established by the government of the canton Bern, in the château Hindelbank, near Berne.

(*f*) ITALY.

37, 38. Two cases. One of the crania which belonged to an individual aged 36, is in the Museum of the Hospital of S. Spirito, at Sassia; the other, aged 19, is in the Museum of Manicomio, at Rome.

Bastonelli, Sopra due casi di microcefalia. Bolletino delle scienze mediche. Bologna, anno 31, ser. iv, vol. xi, Febbrajo, 1859.

G. C. Carus, Zur vergleichenden Symbolik zwischen Menschen und Affenskelet. Act. Acad. Leop. Naturæ Curiosorum, vol. xxviii, 1861.

(*g*) ASIA.

39. Mahratta girl, aged 16.

John Shortt, Description of a living Microcephale,—Journal of the Anthropological Society, No. 15, October 1866, p. 181.

(*h*) AMERICA.

40, 41. The two Aztecs exhibited in Europe; boy Maximo, and the girl Bartola. The head of one of these is said to be in the Museum of Berlin.

Leubuscher, Ueber die Azteken, in—Notizen aus der Natur und Heilkunde, von Froriep, 1856, vol. ii, Nos. 6, 7.

C. G. Carus, Ueber die sogenannten Aztekenkinder, in—Berichte der Akademie in Berlin; Mathematisch-physikalische Classe, 1856, p. 11.

(*i*) AFRICA.

42. Negress, aged 14.

Gratiolet, Observations sur la Microcephalie; Bulletins de la Société d'Anthropologie de Paris, vol. i, p. 34; vol. v, p. 18.

A general treatise, by R. Wagner, on the structure of the brain of microcephali compared with that of the normal brain in man and apes, appeared in 1862 under the title of, "Vorstudien zu einer wissenschaftlichen Morphologie und Physiologie des Menschlichen Gehirns als Seelenorgan." Zweite Abhandlung Ueber den Hirnbau der Mikrocephalen mit vergleichender Rucksicht auf den Bau des Gehirns des Normalen Menschen und der Quadrumanen.

R. Wagner treats here specially of the Jena case (No. 5), and cites the cases of the Sohns (Nos. 2 and 3); Maehre (No. 1), of Gratiolet (Nos. 15, 16, and 34); the child, aged fourteen, described by Baillarger (No. 34); the two cases of Conolly (Nos. 21 and 22), of Cruveilhier (Nos. 11-13), of Plattenhardt (Nos. 8-10), two children of Roringen,

near Goettingen, who have not been scientifically examined; the case of Schuttelndreyer (No. 4), that of Leyden (No. 28), of Maehler (No. 7), and that of Abendberg described by Vrolik.

About the same time Wagner gave a general *résumé* of his views on microcephali, in the "Archiv für Naturgeschichte," of Troschel, 1861, vol. i, p. 63.

M. Gratiolet gives also a summary of his studies on this subject in a "Mémoire sur la microcéphalie considérée dans ses rapports avec la question des caractères du genre humain," in Mémoires de la Soc. d'Anthrop. de Paris, vol. i, p. 61, 1860-1863.

TABLE OF CASES OF MICROCEPHALY, WHOSE AGE AND SEX WERE ASCERTAINED. ARRANGED ACCORDING TO AGE.

Nos. of Order.	Name and Indication of Case.	No. of the preceding list.	Age. Years.	Sex.
1	Gottfried Maehre	1	44	Male.
2	Case of Mr. Gore	23	42	Female.
3	Case of Sassia (Bastanelli)... ...	37	36	Male.
4	Margaritha Maehler	7	33	Female.
5	Schuttelndreyer	4	31	Male.
6	Case of Jena	5	26	„
7	Michel Sohn	2	20	„
8	Case of Leyden	30	20	„
9	Louis Racke	6	20	„
10	Case of Rome (Bastanelli) ...	38	19	„
11	Frederic Sohn	3	18	„
12	Aztec Maximo	40	17	„
13	Sophie Wyss	36	17	Female.
14	Maharatta girl	39	16	„
15	Johann Moegle	8	15	Male.
16	Negress (Baillarger)	42	14	Female.
17	Aztec Bartola	41	14	„
18	Case of Mr. Marshall	29	12	Male.
19	Case of Dr. Conolly	24	11	„
20	Jacob Moegle	9	10	„
21	Case of Abendberg (Vrolik) ...	31	9	„
22	Case of Dr. Conolly	25	7	Female.
23	Johann George Moegle	10	5	Male.
24	A. R., of Abendberg (Valentin) ...	35	5	Female.
25	Case of M. Giraldes	15	4	Male.
26	Case of M. Giraldes	16	4	„
27	Case of M. Baillarger	18	4	Female.
28	Case of M. Cruveilhier	12	3	Male.
29	Case of M. Joly	19	2	„
30	Case of M. Cruveilhier	11	8 months	„
31	Case of M. Cruveilhier	13	new-born.	„

Of these thirty-one cases, nine are of the female sex. In eight other cases, the age of which is unknown but the sex indicated, there

is one female (case of Cork, No. 28); there are thus about 25·6 per cent. or one-fourth of the female sex.

[*To be continued.*]

THE ANTIQUITY OF MAN.

How fully have the discoveries and researches of geologists confirmed the remarks of the poet,—

"The dust we tread upon was once alive."

Everywhere, at various depths, and in various kinds of strata, have the numerous remains of living organisms been found,—the remains of living beings that played their part upon the earth for a time and then disappeared. The geologist has not only ascertained that such dust once lived, but has also arrived at a knowledge of the time which has elapsed since it was alive; so that we talk of the epochs of palæontology very much in the same manner as we do of those of history. Who among the wisest sages, three centuries ago, could have predicted that the crust of this planet should tell such a wonderful story—a story by which a knowledge of the various changes which it has undergone would be carried back millions of years? Who could have foretold then that so many generations of extinct creatures were entombed in the hard rocks, and preserved in a fossil state through periods of time in comparison with which the duration of Egyptian pyramids, catacombs, and mummies, is as insignificant as the lifetime of an ephemeride. Strange tales have, indeed, been told by mammoths, mastodons, plesiosauruses, and trilobites. We are startled when we open any well-written geological work, and read of the successive genera of animals which have inhabited this world, each one lasting its day,—which was doubtless a long one,—and another coming to act its part after it;—when we find it stated, that what is hill was once valley, and that what is valley was once hill;—that what is sea was once land, and that what is land was once sea;—that what is hard and compact rock, was once loose and incoherent sand; and that what is now loose and incoherent sand, was once hard and solid rock;—that our loftiest and most majestic mountains, with their bold granite peaks, defying the elements, were once slag and mud; and that what now forms mud at the bottom of the ocean formed, during olden times, the bold crests of elevated mountain ridges. While reading

about such astonishing matters, may we not, for a very good reason, pause for a moment, and inquire whether we have got into our hands a book somewhat akin to the *Arabian Nights*,—a book pleasing to the fancy, but totally unconnected with the realities of nature? But such is not the case; for as we proceed, we find that startling propositions and assertions are supported by solid arguments and a mighty array of facts. We cannot resist coming to the conclusion, when we weigh these arguments and consider the facts, that there is truth in that which is said,—that many of the statements are incontrovertible, and that assuredly we are not reading a book about dreamland, but one which discusses the sternest realities in the universe.

While many of the wonders of the Old World's history have been revealed by geological discovery, the ancient records of the earth's strata have not, till of late, thrown much light either on the antiquity or early condition of man. Within the last half-century, however, numerous human remains have been discovered buried in strata, which, although comparatively recent, are still of great antiquity when compared with the remotest time to which history can lead us back. Human bones, and even whole skeletons, have been discovered in such strata; while along with these, and in other strata without them, rude tools of stone, bronze, and bone, have been found, which attest that he was an inhabitant of the earth when those strata were formed. The discovery of these ancient human remains has led to various discussions with respect to man's antiquity,—both bones and tools being disputed as genuine; but unwearied scientific research and zeal have in the end triumphed, by fully establishing the genuineness of both bones and tools. The judgment, patience, and calmness with which scientific men have answered carping objections, are extremely praiseworthy; and not only are those tools alone made to supply evidence of man's existence in those ancient times, but the very marks on the bones of those animals which were killed by him, are made to throw light on the case in point. The discovery of the ancient ruins of cities in America, which shows that civilisation once existed in the land where the savage Red Indian has subsisted for innumerable ages on the produce of the chase; and of brown-haired mummies, which prove that the founders of that civilisation were a different race from these Indians, and were probably of European origin, has supplied us with further important evidence of the antiquity of man.

Of late, one of the most distinguished geologists of the age has written an elaborate work on this interesting subject,—a book delightfully written, and fraught with most important information on the question discussed: although, perhaps, a little prolix, and abounding

in irrelevant matter, which tends to make the reader lose sight of the main argument. But it may be said, in palliation of these faults, that the actual geological facts known bearing directly on the question, are, upon the whole, circumscribed; and that, in consequence, the author could not do otherwise than speculate upon the unknown, and point out the fields to be explored, when material to serve his turn was wanting. We have, not, therefore, those few strata only, in which man's remains have been found, described, but a most magnificent delineation of all the strata connected with them, and an elaborate investigation of their history, character, and the changes which they have undergone. So entertaining and fascinating are Sir Charles's descriptions of those gigantic geological revolutions, which have effected such strange changes in the structure of the crust of the earth, that the reader, far from cursing, feels inclined to bless, his digressive propensity. Although Sir Charles Lyell has designated his book *The Geological Evidences of the Antiquity of Man*, yet it should be more properly named "The Geology of the Strata in which Man's Remains have been found, or in which they may be found." Sir Charles has not exclusively restricted himself to the geological evidence; but has availed himself of that furnished by archæology, philology, and physiology. The work is not only one on the geological evidence of man's antiquity; but, also, on all other evidence which can be brought to bear on the point. Although, obviously, Sir Charles Lyell has thrown no new light on the antiquity of man, the most of the evidence brought forward, having previously appeared in other writings; yet he has treated the matter in such a superior manner, has imparted to it so much interest, has cast it in such a new form, and has so united scattered evidence and so conspicuously presented it to view, that the work cannot certainly be called a compilation, but a comprehensive philosophical treatise in which the arguments, discoveries, and observations of others, are used as material for enlarged and profound scientific generalisations.

It is remarked by Emerson, in his "Representative Men," that "Great minds are more distinguished by breadth than by originality," and this breadth of mind is perceived in all the writings of Sir Charles Lyell, in his "Principles" and in his "Elements of Geology"; and it is to this large, comprehensive handling of scientific subjects that a great portion of the extraordinary attractiveness of his writings, is particularly owing. As we read his works we are surprised at his far ken and range of vision, and wonder that so many of the bearings of facts and hypotheses upon each other, escaped our own observation. In considering this work, we can only regret that a book so finely written—a book in which the grand geologic changes connected with, and imme-

diately preceding, human existence, are delineated with the vivid conception of a poet, should, from the nature of the subject, want those enduring elements which ensure immortality. However, as our knowledge of this important question advances, it is to be hoped that this excellent scientific treatise shall keep pace with the progress of discovery by successive editions. It is a work, doubtless, that every lover of science and literature should feel sorry to see shelved or out of print.

It may be said that, in some respects several feel disappointed, on account of having fully expected that the question would have been treated altogether from a geological point of view; but it can easily be conceived that it was hardly possible to restrict it exclusively to the geological evidence; for, without the evidence supplied by other sciences being brought to bear on the geological, the latter could not be so well understood or appreciated. As yet, this department of science is in its infancy, and all that we know of it, is of a scattered and fragmentary character.

To unite isolated and disjointed facts, the sole resource of the writer, in the circumstances, was to reason boldly on the unknown, and bring conjecture to aid in constructing a rational theory capable of explaining the phenomena. The speculative character of the book, and its enlarged generalisations, we consider to be among its highest merits. It is highly suggestive, and cannot fail to lead the reader into new trains of thinking; for the writer never allows him to view the scenery from one point; but successively presents it to him from different positions, owing to which he is enabled to see it in all its variety. Well, indeed, do the words of Emerson apply to Sir Charles in this respect:—"Every surmise and vaticination of the mind is entitled to a certain respect; and we learn to prefer imperfect theories and sentences, which contain glimpses of truth, to digested systems which have no one valuable suggestion. A wise writer will feel that the ends of study and composition are best answered by announcing undiscovered regions of thought, and so communicating, through hope, new activity to the torpid spirit."

Indeed, "announcing undiscovered regions of thought," appears to be a principal aim of the "Antiquity of Man," and in few works has it done this to more purpose, and, assuredly, not many books are so well calculated to communicate "new activity to the torpid spirit" as this one is.

The first eleven chapters of the book discuss questions connected with those strata in particular, in which either the bones of man, or implements employed by him, or works constructed by him, have been found. We have a long and interesting account of the Danish

peat bogs, mounds, and kitchen middens, which have, for a length of time, so much excited the interest of archæologists and geologists. Those curious lake dwellings which have of late years been discovered in such large numbers, receive a large share of the author's attention. The flint instruments, first discovered and examined by M. Boucher de Perthes, are brought prominently before the reader's view; while the arguments of that celebrated man are recapitulated and put in a new light. The ages of stone, bronze, and iron, are examined, and their relative antiquity considered. The progress of man, however, from the use of stone tools to those of bronze, and from those of bronze to those of iron, affords but an uncertain guide to the tracing of man's antiquity; since all these kinds of tools may have been used contemporaneously by different tribes and nations bordering upon one another; while the substitution of the one kind for the other may be as often owing to conquest as to its gradual introduction either by native discovery or commerce. There is very great reason to think that, long after the introduction of iron, both stone and bronze tools were used. Even in the time of Tacitus, arrows headed with bone were used by the Fenni, a tribe that inhabited the north-east of ancient Germany. Tacitus assigns as a reason for using bone the scarcity of iron; but we may reasonably assume that it was fully as much owing to the low civilisation which he ascribes to them. If in the time of Tacitus this people used arrows headed with bone, it is not unlikely that stone weapons were also employed by them; and on this account there are good grounds for inferring that a few centuries before the time of Tacitus both stone and bronze weapons were by no means unfrequent among several European tribes. The readiness with which iron succeeded other metals and stone, no doubt depended much on the aptitude of different peoples to use or apply it; and when different nations were fiercely waging war with one another, it may well be supposed that those who lived in an iron-producing country, would use all their endeavours to prevent those who lived in a country less favoured to obtain this metal; so that, in consequence, the latter would be constrained to use such substances as stone or bone from absolute want of that which was more efficient.

What the civilisation of the Fenni was, may be best learnt from Tacitus's own words:—"Fennis mina feritas, fœda paupertas; non arma, non equi, non penates; victui herba, vestitui pelles: cubile humus: sola in sagittis spes, quas inopia ferri ossibus asperant." *

While the extraordinary revelations of the peat mosses and shell mounds of Denmark, with respect to the existence of man in that country long before the historic period, excite our amazement, not

* Tacitus, *Germania*, cap. 47.

less striking are the wonderful tales told by those curious lake dwellings which have of late years been discovered in such large numbers. When these lake dwellings are considered, as well as the peat mosses and shell mounds of Denmark, the antiquity ascribed to them cannot be said to be in the least exaggerated; and an age of 7,000 years assigned to the oldest, may be said to be under rather than above that which is justified by facts. As beech flourished in Denmark two thousand years ago, we may reasonably allow it a duration of two thousand years previous to that time, and as it flourishes now as well as ever, we may justly infer that it will last at least a thousand years longer. Climate changes slowly, and so do the physical features of a country; and, during those slow changes, one species of tree followed the other in the forests of Denmark. Four thousand years is about as short a time as we can allow for the duration of beech, and, certainly, we may allow twice the time for a succession of two kinds of oak; this will give a duration of 11,000 years to the highest portion of the Scotch fir. When we consider that since the inhabitants of the Danish Isles, whose remains are found in the shell-mounds, lived, the physical features of Denmark, and the communication between the Atlantic and the Baltic, have been so much altered, as to affect materially oysters and other shell-fish found on the coast, to conclude that such a time has elapsed since the shells were deposited in the mounds is highly reasonable.

There is no country which tends to impress the mind with a stronger belief in the great antiquity of man than the land of the Pharaohs. Here are to be seen the remains of a mighty civilisation, the beginning of which is completely hidden from our view by the mist of ages. Immense pyramids, vast cities in ruin, gigantic sculptures, paintings which have defied the injuries of time, hieroglyphics, and mummies, about which early history is ignorant, and which were greater mysteries to Plato and Herodotus than to modern Egyptologists. How remote must that period be when the ancient Egyptian, like the savage inhabitants of Europe at the time when Denmark was covered with forests of Scotch fir, or like the modern natives of Australia, New Caledonia, New Guinea, and other South Sea islands, wrought with stone implements and fought with flint and bone weapons! When the inhabitants of Denmark, whose remains are found in the shell mounds and peat mosses, killed wild beasts with bone weapons and cut them down with flint hatchets; when the inhabitants of Switzerland raised their wooden-huts on lakes and feasted on the flesh of the fox; did not the mighty cities of Egypt flourish in all their magnificence, abounding in superior artists and profound men of science? their inhabitants in possession of numerous luxuries and refinements; with a learned priesthood and

stable government; the useful arts ministering to their wants, and supplying them with innumerable comforts and enjoyments. Did not those ancient Egyptians trade along the coasts of the Mediterranean? and had they no intercourse with the barbarous tribes of Europe? Did not bronze and iron find their way across the Mediterranean from Egypt and Phœnicia to Greece, Italy, and Gaul? From the amazing progress which has been made during the last thirty years, in the knowledge of everything relating to man in prehistoric times, we are led to think that not many years shall elapse ere all these questions shall be satisfactorily answered. Egypt seems to us to be the land, more than any other, which brings archæology more closely in contact with geology; and nothing can be more pleasing to the lovers of science than to learn that the Nile mud deposit is likely to afford a clue to the knowledge of the antiquity of Egyptian civilisation. Almost every year some new light is thrown upon this subject by the discovery of ancient remains at various depths in the Nile valley.

Long after its discovery America was considered to be a land which had never made any progress in civilisation, a land which had not even been inhabited many centuries before Europeans had visited its shores, and whose inhabitants were supposed to have entered it by Behring's Straits from Asia. The Spaniards encountered in Mexico and Peru a very rudimentary civilisation, certainly, which was supposed to have been imported from the old world. No land could be imagined to form a greater contrast to Egypt than America, from being apparently so void of all monuments of ancient human art. But this continent appears now in a different light; monuments of ancient civilisation have been discovered over a vast extent of territory. Huge mounds, ruins of cities, sculpture, articles of gold and silver, and pottery attest that the western hemisphere was not always a dreary, vast, interminable forest, serving no other human purpose than a hunting ground for the naked, savage Red Indian. Those who created this civilisation seem to have been a different race from any of the present aboriginal ones; for the skulls excavated from some of the burying places are different from those of the Red Indians. Of late, mummies have been discovered in South America with brown hair, a fact which proves that a brown-haired race, at one time, abounded there. Whence this brown-haired race arrived, if not autochthonous, is a question not easily answered at present. If from Europe, they must have emigrated at a time long anterior to the earliest period described in history; and a civilisation must have existed on the western shores of this continent, of which all traces were lost at the time when the Roman sway prevailed in Britain, Gaul, and Spain. It may now be positively affirmed that America was inhabited by man at a very remote period, as human

remains are found there which have all the appearance of being as ancient as those found on the old continent. Under four superimposed forests, in the delta of the Mississippi, a human skeleton, along with some charcoal, is said to have been found, to which Dr. Dowler ascribes an antiquity of 50,000 years. Count Tourtalais found fossil human bones, consisting of jaws; with some bones of the foot, in a calcareous conglomerate forming part of the coral reefs of Florida, which are estimated by Professor Agassiz to be 10,000 years old. At Natchez a human bone was discovered mingled with those of the mastodon and megalonyx. From these discoveries we anticipate a great many more in a few years to come.

Old as are the human remains found in the Danish shell-mounds and peat mosses in the lake dwellings, in the coral reefs of Florida, in cromlechs, barrows, and kist-vaens, much older than these, by far, are the flint implements and bones of man discovered in post-pliocene formations, in France, Belgium, and Sicily. In the valley of the Somme, in the valley of the Ouse, in the basin of the Seine, in the basin of the Thames, in the clay of the Hoxne, in the gravel of Icklingham, in the valley of the Ouse, in the caves of Engis, Engîhoul, and Neanderthal, in a cavern near Wells, in the caves of Gower in Glamorganshire, in the Grotta di Maccagnone in Sicily, the indefatigable zeal and perseverance of the man of science, have traced out the bones of man and the rude stone tools used by him at a primitive stage of his existence, associated with the bones of numerous extinct species of animals, which passed away along with the telluric conditions to which their organism was related.

It is to M. Boucher de Perthes that the world owes the first discovery of these flint instruments in ancient alluvium containing the bones of extinct animals,—a discovery doubted for years, the sceptical suspecting that the tools were spurious; but, at last, their genuineness has been completely established. No doubt there were impostures which justified the exercise of a degree of caution on the part of those who had not acquired the experimental skill in these matters, which readily distinguishes the real from the counterfeit. This skill, according to Sir Charles Lyell, was possessed by M. Boucher de Perthes, of whom he speaks in the following terms:—

"The antiquarian knowledge of their discoverer enabled him to recognise, in their rude and peculiar type, a character distinct from that of the polished stone weapons of a later period, usually called 'celts.'"

The land and sea, the hills and valleys, the flora and fauna of Europe, have undergone vast and extraordinary mutations since man first trod upon its soil. Elephants and rhinoceroses grazed in the valleys of France and England; hippopotamuses bathed in their rivers; and cave lions and cave hyænas prowled in their forests, long after his appear-

ance in these countries. Long, indeed, must those men, whose remains are found in the post-pliocene deposit of the valley of the Somme, and in those singular caves in Belgium, England, and Sicily, mixed with the bones of these extinct animals, and which have so attracted the attention of men of science,—long must they have preceded those men whose remains are found in the shell-mounds of Denmark. Long, indeed, must have been the lapse of time from the period since those extinct species of animals abounded in large numbers till they disappeared entirely from the face of the earth! Countless generations of those men whose remains are found in the Danish peat-mosses and shell mounds, lived, died, and followed each other in succession through numerous ages and centuries; but with those extinct animals the earliest of these generations were not contemporaries.

Of Sir Charles's work seven chapters are devoted to the glacial period, from the twelfth to the eighteenth inclusive; and although, in the present state of our knowledge, this period is not so intimately connected with the question discussed, there being, as yet, no remains of man found in formations belonging to it, or preceding it; still it is the limit to the formations in which those remains have hitherto been discovered.

"It often happens," says our illustrious author, "that when in any given region we have pushed back our geological investigations as far as we can in search of evidence of the first appearance of man in Europe, we are stopped by arriving at what is called the 'boulder clay,' or 'northern drift.' This formation is usually quite destitute of organic remains, so that the thread of our inquiry into the history of the animate creation, as well as of man, is abruptly cut short. The interruption, however, is by no means encountered at the same point of time in every district. Several Anthropologists are of opinion that man lived on the earth during most of the glacial period; but no sufficiently authenticated remains of him can, in the meantime, be pointed out to support this view.

These seven chapters on the glacial period form decidedly the most interesting portion of the book. The reader, who has already read all the scattered papers and dry tedious articles which have appeared on this department of geology, cannot but admire the plastic intellect of the writer who has reduced to order such a chaotic mass of details, and who has imparted beauty and fresh glowing life to a cumbrous heap of dull matter. His vivid description of the appearance which the surface of the earth presented during this singular period, when cold and ice ruled triumphant in the northern hemisphere, may well bear comparison with some of the most brilliant passages of our most distinguished historians. As we read these chapters we are transported

from the present world around us to that of hundreds of thousands years ago, when frozen seas occupied the space where well-peopled countries, abounding in numerous large busy towns, are found; in which seas huge icebergs floated in various directions, as is at present the case in the Arctic and Antarctic Oceans; when arctic mollusks lived in the Mediterranean; when the favoured land of Italy felt the chill of a northern climate; and when the glorious land of the East,

"Where all save the presence of man is divine,"

was familiar with ice; glaciers covering these Syrian mountains, which, myriads of years thereafter, supplied those far-famed cedars that were used by Solomon in the building of the temple.

Long did this period last; its duration may, indeed, be counted in hundreds of centuries; and while it lasted, mighty were the changes which were effected;—land was submerged, and the sea rolled over it for many centuries;—the bottom of the "vasty deep" emerged, threw off the yoke of Neptune, and claimed the right of being dry land; mountains, thousands of feet high, whose summits were lost in the azure vault of heaven, sank into the depths of the earth, and many fathoms of brine flowed over them;—the strata which formed the bottom of the abyss defied and overcame the pressure of the ponderous ocean, and sprang up in tall peaks to the sky;—more than once were these strange things enacted;—and lands which sank emerged once more, while those that had formerly emerged, were submerged. At one stage of the glacial period, according to that theory of emergence and submergence, which, in Sir Charles's opinion, best explains the phenomena, the mountains of Wales were much higher than at present;—at another stage 2,300 feet lower; at one stage of it, Scotland was 2,000 feet below its present level, and other parts of Britain 1,300 feet; then Great Britain and Ireland consisted of a few groups of small islands formed by the mountains of Wales, Cumberland, the Scottish highlands, Munster and Connaught, and, probably, of a larger island formed by the portion of England south of the Severn and the Thames. When we look at the maps at Chap. xiv. of this work, how strange are the emotions awakened within us as we think of the German Ocean and the Irish Sea forming one continuous body of water, studded with a few groups of small islands, which, during that period, represented the large islands of Great Britain and Ireland;—when we imagine ourselves standing upon a lofty peak in one of those islets, looking around on a sea covered with enormous masses of floating ice, and rolling its waves over strata which now form the rich territory where the large and populous towns of Edinburgh, Glasgow, Manchester, and Liverpool, at present stand; whose extensive commerce employs those innumerable ships which sail, with their

white canvas swelling in the gale, on those two seas on each side of Great Britain, which are the remains of that continuous ice-covered ocean!

Whether man existed while this long period of glaciation prevailed has not yet been determined; although his remains being found in contact with glacial formations corroborates the opinion of those who maintain that he did. The formations of the glacial period itself, as clearly pointed out by Sir Charles, are, for the most part, destitute of organic remains; so that, if any indications of himself or of his works are to be discovered in connection with this period, it is in preglacial strata that archæologists and geologists are to look for them. On this point Sir Charles remarks:—

"For the present we must be content to wait, and consider that we have made no investigations which entitle us to wonder that the bones or stone weapons of the era of the *Elephas meridionalis* have failed to come to light. If any such lie hid in those strata, and should hereafter be revealed to us, they would carry back the antiquity of man to a distance of time probably more than twice as great as that which separates our era from that of the most ancient of the tool-bearing gravels yet discovered in Picardy or elsewhere. But even then the reader will perceive that the age of man, though preglacial, would be so moderate in the great geological calendar, as given at p. 7, that he would scarcely date as far back as the commencement of the post-pliocene period."

The last four chapters of the work are devoted to a consideration of the theories of "transmutation and progression," of the doctrine of "variation and natural selection," as propounded by Mr. Darwin, and of the "Aryan migrations and language." Throughout these chapters we perceive a strong leaning towards Mr. Darwin's theory of the origin of species. Were we to suppose this theory true, and assume that all the races of mankind which at present inhabit the earth, are derived from one original race by "variation and natural selection," we may arrive at some notions of the antiquity of man, by observing any changes which have taken place in the characteristics of these races, during that period of time in which history, sculpture, and other human records lend us their aid. But so far as these yield us their light, no change which scientific acumen can as yet discover, has taken place in the physical or mental primary qualities of any race;—the Silurians, the native race of south Wales, are still dark, and the Caledonians, the native race of the north-east of Scotland, red-haired and large-limbed, as they were in the days of Tacitus;—the modern Gaul is as easily elevated and depressed in spirit and as full of curiosity as his ancestor was in the age of Cæsar;—Sir Archibald Alison points out in his History of Europe, that the modern Iberian displayed the

same patriotic enthusiastic courage in defending Saragossa, as the ancient Iberian did in defending Numantia;—under William the Silent, in defence of civil and religious liberty against the bigoted tyranny of Philip the Second, the Dutch manifested the same ferocious, sturdy, obstinate valour, and love of personal freedom, which led classical writers to designate their Batavian forefathers the bravest of the German nations;—the modern Copts and Nubians are identical in form and features with the ancient Egyptians;—the Negroes of to-day are identical with those of 4,000 years ago;—the Icelanders, whose Scandinavian ancestors settled in Iceland upwards of a thousand years ago, vary not in form, features, or character, from kindred peoples on the European continent;—and the peculiar physical and mental qualities of the same Scandinavian race, blended in various degrees with those of the Celts, are readily distinguishable in the Hebrides, along the shores of the western highlands, and in the east of Ireland; where the intermixture, although it took place a thousand years ago, has produced no new uniform race, but merely a mixed people. If all these races have been developed from one stock, and become what they are by a certain "law of variation and natural selection," the rate of change has been so slow as not to be perceptible in 4,000 years; now, a change going on at an uniform rate, which is not perceptible in such a length of time, would not be very striking in ten times this number of years, or 40,000; and we may safely assert that it would not produce so great a difference as exists between the Australian and Scandinavian in ten times that number of years again, which would amount to 400,000 years. Were this theory therefore true, it would carry back the antiquity of man far beyond anything which geology has hitherto brought to light; but, however ingenious and attractive it may be, and however readily it may explain the phenomena of organic life, it must be said that in its present form, it is not thoroughly borne out by facts; while numerous objections, founded on the peculiar conditions of animal generation and descent, may, more especially, be brought against many of its extreme points.

"The Origin of Species," displays the immense physiological information and rare talents of the author; while the suggestiveness of the general views, and the bold, rich, glowing speculative vein of thought which pervades the work, entitle it to hold the first rank among books on the philosophy of science; yet, in the meantime, we must express our dissent from its extreme conclusions, and our doubt of species having been produced within the same range of influences as varieties are. With all its faults, the student of nature can hardly take up any manual which gives a more profound insight into the laws that govern the animal world than Mr. Darwin's work; and Professor Huxley

may truly say that the Darwinian theory bears the same relation to a true physiological science, as the Copernican theory does to a true astronomical one. This comparison is altogether judicious; for when Copernicus placed the sun in the centre of the solar system, he laid the foundation of a true astronomy; but he made the planets move round him in circles; and this circular motion assumed for one which is really elliptical and spiral, is not unlike the doctrine of "variation and natural selection" carried to extremes. Let the *circularity* of the doctrine be a little modified and some *eccentricity* introduced, as has been done with regard to the Copernican theory, and there is a probability that the true theory is found. That species have been produced by "natural selection and variation," independently of general changes in the condition of the globe, is a point highly questionable, notwithstanding all that is said by Mr. Darwin on the pigeon race. The production of an endless number of varieties is highly possible; but we hold that there is a limit to their range. In looking at the animal world around us, we perceive that every species has a range of modification, which is entirely dependent on certain conditions; but the several modifications seem to resemble imperfect circles, an endless number of which can be described, all varying from each other, but bearing a resemblance more or less close to a perfect one. A breed of oxen, sheep, or horses, may be improved to a certain pitch; but here the improvement ceases; and, in a similar manner, education and other influences produce certain changes on the races of mankind; but to these changes also there is a limit—a barrier which cannot be passed. Nowhere has it been found that civilisation or climate has produced any effect on one race, tending to change it into another. In the East Indies Frisians have not been converted into Malays; in South America Iberians have not been converted into Red Indians; the Portuguese have not been transmuted into Negroes or Caffres in Africa, or into Chinese in Macao; the French are the same race in Cayenne, Guadaloupe, Louisiana, and Canada; in every zone, and under the influence of almost every climate, these peoples have retained the peculiar physical and mental characteristics of the races to which they respectively belong. If mankind were originally one race, the most probable explanation of the present diversity is, that it has been produced by great general changes in climate, as well as in other physical conditions of the globe. We learn from geology how often the climate of the earth has changed; but we do not yet, very well, understand how those changes were brought about; probably astronomy may, in a few years, throw some light on this obscure subject, and reveal the existence of some conditions by which the earth and her inhabitants are influenced at some periods more than at others, exactly

as is the case with the four seasons of the year. Then it may, perhaps, be ascertained that diversity of race has been produced in a shorter time than that in which the doctrine of "variation" would account for it. Eminent Anthropologists point out the recurrence of mixed races to the original native type, after a lapse of centuries, and adduce Spain, France, and Italy, as instances of countries in which the blood of the intrusive conquering peoples, has, to a great extent, disappeared, and whose present inhabitants are almost identical in racial qualities with those who preceded the intermixture with invaders. In families we observe that atavism is a wonderfully prevalent law; that there is nothing more frequent than to observe children closely resembling grandfathers and great-grandfathers; that, sometimes, the different features are inherited from different progenitors; that a peculiar form of nose, eye, chin, hand, or foot, may be traced out among several third and fourth cousins; that a colour of eye, which has disappeared in two generations, returns in the third; and that the colour of hair and shape of head, which have disappeared in three generations, return in the fourth. We observe, when parents differ in the colour of the hair, that, usually, the children have, alternately, the hair of father or mother. If the father has red hair and the mother flaxen, these colours do not mix, but the child is either flaxen-haired or red-haired; or if grandfather or grandmother was brown or black-haired, probably brown or black-haired. The same remarks apply to all the different parts of the body,—to the complexion, the colour of the skin, the voice, and the walk.

A similar law of recurrence pervades the animal kingdom, and is observed in families of horses, swine, oxen, sheep, dogs, and cats. The following is an instance of the law of succession in the case of cats:—The daughter and grandmother are similar in colour and form, the colour of each being dark grey spots on a white ground; the mother and great-grandmother, also, resemble each other in form and colour, the colour of each being red spots on a white ground. Similar instances might be multiplied in the case of other animals. It will be perceived, then, that here we have a limit to endless variation, by which varieties are circumscribed and held to a central normal type. When animals are brought from one country, or continent, to another, they undergo some change, as the case may be, corresponding to the new influences brought to bear upon them; but in a few generations they acquire a fixed form and character.

The usual boundary employed to separate species we believe to be wrongly fixed. Whether species breed together or not depends upon their nearness or remoteness. Those which are remote from one another do not breed, those which are somewhat near produce hybrids which do not breed with one another, and those which are nearer pro-

duce a mixed breed the duration of which is proportionate to their proximity. Difference and permanency of type is the true distinction of species. A modification of a permanent type constitutes a variety. The permanency of species may be said to be limited by geologic changes, accompanied by general changes of climate; while variety is dependent on partial differences of climate in different parts of the earth, on local circumstances, and on artificial expedients. We learn, from geology, that the crust of the earth has undergone numerous successive changes, and that while these changes were being effected old species disappeared and new ones appeared. This appearance of new species and disappearance of old ones, is, certainly, more satisfactorily explained by the theory of transmutation than by any other hitherto offered, and this transmutation has, doubtless, been effected by peculiar conditions of the earth, and not in the ordinary manner in which varieties are produced. The strongest objections made to the theory of transmutation have, no doubt, been made, principally, in consequence of the conclusions to which it leads, viz., in uniting man so closely with the animal-creation; but granting man to be developed from the lower animals, it does not necessarily make him one of them, any more than it makes an animal one of the vegetables by conceiving the animal kingdom to be derived from the latter. The several divisions of nature pass imperceptibly into one another; and, as the line of demarcation is not very distinct, the difference is more properly seen at a distance from the boundary.

The different races are, no doubt, of different antiquity, and the lower ones, assuming the theory of progression to be true, are the oldest. Ten thousand years are but as yesterday in the antiquity of man; races are, to all appearance, extinct now which inhabited the world myriads of years before Celts, Scandinavians, Saxons, Slavonians, or Iberians were in existence; and, probably, Negroes, Hottentots, Australians, and Red Indians, played their part on the face of the globe a hundred thousand years before white skins, blue eyes, and light hair appeared in Europe.

Those ancient skulls which have been discovered within the last few years, have led to rare and interesting discussions, and their peculiar development strongly supports the theory of transmutation and progression. The Neanderthal skull has certainly acquired a celebrity which we may be sure its owner never expected in his lifetime; and has suggested as many suppositions as were suggested to Hamlet by the skulls thrown up by the gravediggers. Several scientific men think that this skull belongs to an individual of a race which became extinct thousands of years preceding the historic period, but we must be cautious in our speculations until more of the kind are found.

The twenty-third chapter of Sir Charles's work on the Antiquity of Man is devoted to the subject of language. Philologists have discovered widely prevailing analogies among numerous groups of languages, in consequence of which they have been led to examine their structure with care and attention; and, from vigilant research, they have arrived at the conclusion that each of these groups has been derived from one common tongue. The most important of these groups is that usually called the Indo-European, or Aryan. These Aryan languages extend from the Ganges to the Atlantic; and it would of course, have required a great many ages for one language to ramify into so many others, which are now so widely different that common affinities can only be perceived and traced out by the ablest scholars. Of these languages Sanscrit is the farthest east, and Gaelic the farthest west. Were there a rate of change known so far as regards speech, it can readily be conceived that the time which has elapsed since the Aryan language was one till the present, might be estimated; but the rate at which language undergoes change, is so dependent upon peculiar circumstances, and so inconsistent, that it is exceedingly difficult to render its mutations available as a measure of duration. The Aryans are supposed to have extended themselves from central Asia eastward into India, and westward into Europe, forming several nations both in Europe and in Asia; but a strong objection to this theory of Aryan migration is, that the peoples and nations which speak these cognate languages, consist of widely different races, and that if they were all derived from this single Aryan race, a much larger time must be allowed for their conversion into several new races than the advocates of the Aryan theory assign to those migrations; but on the supposition that the Aryans were a conquering people, who subdued aboriginal races, intermixed with them, and imposed their language upon them, this difficulty is removed. In order to give a rational explanation of the phenomena of anthropology, it is certain that a much higher antiquity must be assigned to man than has hitherto been done, and doubtless Sir Charles Lyell has underrated rather than overrated it. A more temperate treatise than his could hardly be written on a question which, at present, excites the strongest interest in the scientific world.

The handling of such a subject as the Antiquity of Man, as may be easily conceived, requires to be done with circumspection; as any views that may clash with the present accepted interpretation of holy writ are sure to elicit the cry of heterodoxy from the bigoted; and disagreeable contests between the teachers of Christianity and the votaries of science, should be, as much as possible, avoided. That the teacher of religion should feel alarmed at any new speculations

which he may think lead to the diffusion of theological error, is nothing strange ; and, supposing he may give them undue opposition, he is, to a certain extent, to be excused for his zeal and well-meaning intentions ; also, if the enthusiastic man of science starts bold hypotheses, not sufficiently supported by facts or observation, he is still entitled to be treated with a degree of indulgence by the religious community. It is very much to be regretted that almost every advance which has for centuries been made in science, has been, at the commencement, violently opposed by many of the clergy. Surely the strong opposition which has so frequently been offered to new views on such matters, subsequently established, ought to teach those who are ready to risk the truth of scripture on received explanations, more caution. It may be safely affirmed that many of the current interpretations of the sacred text, cannot be reconciled with the facts of science ; but it is to be hoped that some of our erudite and profound divines will give this question their calm consideration, and so throw such light upon it as shall remove the contradictions between christian theology and anthropology.

POSITION OF THE FORAMEN MAGNUM.

By Professor Jeffreys Wyman, Corr. Memb. A.S.L.*

The fact, to which attention was called by Daubenton, more than a century ago,† that the foramen magnum is situated farther back in apes than in man, naturally led anatomists to inquire whether any of the human races more nearly approach the apes in this respect than the rest. Soemmering made the assertion that such is the case in the Negro, and his statement has been quite generally repeated by subsequent writers. Prichard, however, satisfied himself that such is not the case, and after having examined "many Negro skulls," states that the foramen corresponds in position with that of the white races, viz.: "exactly behind the middle of the antero-posterior diameter of the basis cranii."‡ He, however, finds it necessary, in order that this should be the case, to make some allowance for the projection of the jaws. We have seen no account of the manner in which the measurements on which this opinion rests were made, except that the jaws

* From the *Proceedings of the Boston Natural History Society*, vol. x, 1868.

† "Sur la Difference du Grand Trou Occipital dans l'Homme et dans les autres Animaux. *Mémoires de l'Acad. des Sciences*, 1764.

‡ *Researches into the Physical History of Man*, vol. i, p. 285, London, 1851.

were included when the antero-posterior diameter of the head is spoken of. It is obvious that in comparing more or less prognathous races, the position of the foramen magnum may be found to vary, although there may be no variation when the cranium proper is alone considered. In other words the bones of the face may vary independently of the cranium.

The more common method adopted has been to measure from the anterior edge of the foramen magnum to the edge of the alveoli in the middle of the upper jaw, and from the foramen to the most prominent point of the occiput. It seems to us more correct to determine the position of the foramen, with regard to the cranium, than with regard to the cranium and face, especially as the chief interest which attaches to the foramen is an index of the relation of the spinal marrow to the cerebral mass.

In making the measurements on which the following table is based, we have kept this circumstance in view, and have adopted the following method. The long diameter, from the glabella to the occiput, having been previously measured with the callipers, is made horizontal by bringing the two ends of it to correspond with the points of the indices on the graduated uprights, and on which the indices are adjusted to the same elevation. Two moveable plumb lines, suspended from a wire stretched across the upper part of the frame, are then so adjusted that one dropping through the foramen magnum touches its anterior border, while the other touches the most prominent part of the occiput. The position of the foramen is indicated by the ratio of the distance comprised between the two plumb lines, to the long diameter of the cranium proper. The number expressing this ratio may be called *the index of the foramen magnum*, thus conforming to the method of expressing the ratio of the breadth, or the height to the length. When it is said that the index of the foramen magnum is 45.4, it is understood that the distance of the anterior edge of the foramen from the most projecting part of the occiput, is 45.4 parts of the long diameter, this last being considered 100, and both being projected on to the same plane.

	20 White.	5 Teuktehi.	17 Negroes.	28 S. Islanders.	19 Hindoos.	46 N. American Indians.	3 Gorillas.	1 young Gorilla.	1 Chimpanzee.	3 young Chimpanzees.
Maximum,	50.0	47.2	48.7	47.5	45.4	47.8	26.8			39
Mean,	45.6	45.3	44.4	41.8	41.4	40.9	22.7	40	21	35.3
Minimum,	41.7	44	38.7	36.1	35.6	34.8	17.7			32
Range,	8.3	3.2	10.0	11.4	9.8	13.0				

To avoid error, it is important that the long diameter of the head should be made as nearly horizontal as possible, for the foramen magnum being on a higher plane, as the long diameter is tilted backwards or forwards, moves through an arc of a circle, which changes the position of the point where the vertical cuts the horizontal line.

The preceding table, in which the number of the skulls of each race examined is given at the top of the respective columns, shows that there is an actual difference in the position of the foramen magnum in the races compared, and of such an amount as to make it desirable to test the result with much larger collections, in order to determine more precisely the value of the position of this opening as a race character.

As far as this table can be accepted, it shows that while there is a difference between the human races as regards the position of the foramen magnum, it is quite small when compared with the difference between the human races and the apes; and, contrary to Soemmering's assertion, the Negro does not make the nearest approach to the latter; and on the other hand, although the negro cranium does not precisely agree with that of the white races, as stated by Prichard, it very nearly approaches it. It is the North-American Indian which has the lowest index.*

THE PROCESS OF DERIVATION OF THE SPANISH LANGUAGE FROM THE LATIN.

BEING PART OF THE "DISCURSO PRELIMINAR" TO THE "ROMANCERO Y CANCIONERO." BY DON AGUSTIN DURAN.

Translated from the Spanish by J. G. Hincks.

It is difficult, if not impossible, to determine the period when the modern languages, emancipating themselves from the Latin, became common, and were constructed of forms essentially different to those of the primitive tongue. Observing, however, the course prescribed in similar cases by nature and necessity, we may presume somewhat upon the time and manner of their formation. This began with the

* The position of the foramen magnum, as will be seen by this table, is very different in the young from what it is in the adult apes, the former approaching much nearer to the human races than the latter. We have pointed out in a former volume of the *Proceedings* (ix, p. 203) other striking resemblances between the cranium of the young gorilla and the adult man, which are much diminished as age advances.

conquest of the Western Empire by the barbarous nations of the North. From that time, undoubtedly, the vulgar Latin began to decay, degenerate, and become mixed, ceding in its difficult and complicated construction to the rude intelligence of the conquerors. Its words being corrupted, it also adopted the simple syntax of the barbarous Northern tongues, and lost the rich and sonorous prosody belonging to languages of Oriental origin.

The rustic or provincial dialects (*lenguas rústicas**) were produced by corrupting the Latin pronunciation, altering the sound of the letters, and forming their nouns, adjectives, and even verbs, some from the root only, † others from the desinences of some corresponding case or tense of the mother tongue.‡ The constant and most essential difference between the Latin and the modern languages derived from it, consists in the latter having—

1st. Suppressed the declension of the noun ;

2nd. Employed the anteposition of particles to distinguish the case ;

3rd. Adopted articles to determine gender and relation ; and

4th. Substituted for the direct conjugation of the passive voice, the union of the auxiliary with the past participle of the verb.

It is worthy of notice that the pronunciation of these languages §

* Thus are named the different jargons formed by corrupting the Latin prosody, pronunciation, and syntax.

† The *Provenzal* for instance. This language, as well as the Francica or Theotisca, was still in existence at the beginning of the French monarchy. The first must have originated among the Goths, who occupied the north of Spain and the South of France ; traces of the formation of some of its words are still to be met with in very old Latin documents. Several decrees ordered that sermons should be preached, and religious instruction given in, the *lenguas rústicas ;* and, according to Meyer, in the seventh century, the Bishop of Tournay and Montemolin, elected after the death of St. Eloi, was as learned in the *Theotisca* idiom as in the Latin. In the eighth century, when the litanies were sung, the people replied *ora pro nos*, suppressing the desinence of *nobis*, and *tu lo juva*, placing the *Provenzal* particle, *lo*, before the verb instead of the Latin pronoun. In the document of the Moorish king of Coimbra, which is cited in the fifth note, we find words entirely *Provenzal*, *e* for *et*, *esparte* for *esparce*, *pecten* or *peiten* for *pectent* or *pendant*. According to Luitprand, in the year 728, the Catalan and the Valencian were considered established languages in Spain, and were consequently formed before the Arab conquest. This gives probability to the conjecture that the Provenzal took its origin among the Goths, who inhabited the south of France. Whoever cares to enter more thoroughly into this question, should consult the first volume of Raynouard's *Poesias originales de los Trovadores*.

‡ The Castilian, Italian, and French.

§ Each was distinguished by its affirmative particle, the *Provenzal* being called the language of *Oc* ; the Walona, afterwards the French, that of *Oui* ; the Castilian, Italian, and Portuguese, of *Si*, and the Teutonic, of *Ja*.

is more often more closely resembling the original, and less contracted, in proportion as the nations who speak them approach the South, thus proving how climate influences the vocal, guttural, and aural organs. We must, however, except the *Provenzal*, which for its construction adopted Latin roots only. For this reason, and because it was the first formed, it serves as an intermediate step to the others.

But before any of these real languages, irregular jargons were formed, like those we now call *algarabias* or *francas*, which are used by nations who speak different idioms to communicate with each other.

In Spain, as in other parts, arose many of these jargons or *lenguas rústicas*, and among them undoubtedly that, which, cultivated and perfected, is now the dominant language,—the Castilian. Springing like the others from necessity, at first rude and incomplete like them all, it alone could be employed in arranging the indispensable communications between the conquerors and the conquered. The latter, being weakened, had no more power to preserve their dialect, than to defend their homes, and the former, a barbarous race, were neither able nor willing to study a language which, besides being complicated and difficult, had the disadvantage of belonging to a conquered and degraded race. The first, then, not attempting to struggle with the Latin idiom, and the last, not accommodating themselves to the rudeness and poverty of the Northern tongue, in each province resulted the final triumph of the *lengua rústica* which was most cultivated and complete, and with it the ruin, not only of its equals, but also of its elementaries.

No relic of the period before the Moorish invasion remains to us, written in that *lengua rústica** which, when perfected, was called Castilian, but the old narrative romance is still in existence, although belonging to a much later epoch, and modernised or altered by oral tradition, yet preserves so rude a diction and so barbarous a construction, that it may be easily inferred how informal and irregular must have been the language employed in anterior compositions.

* Before the Gothic invasion, the Cantabrian, Phœnician, Greek, Hebrew, Chaldæan, Latin, and Celtiberian languages were spoken in Spain. The Arabic afterwards became general, and replaced them, putting an end to them in the provinces long possessed by the Moors, and in other parts being substituted for those which had formerly existed there. All the above-named languages contributed some words and etymologies to the Castilian; but the greater number of these belongs to the Latin. The Arabs also rendered tribute to the tongue of Virgil and Cicero; since, among the chronicles of Bishop Idacio, is a document made by the Moorish king of Coimbra, in the year 734, which begins thus:—"*Alboucen Iben-Mahumet Iben-Tarif, bellator fortis, vincitor Hispaniarum, dominator Cantabriæ Gothorum, et magnæ litis Roderici,*" etc.

It would be useless, were it possible, to ascertain whether these primitive people, after having discovered alphabetical characters, used them in writing poems before chronicles, or verse before prose. But it is certain that all, or nearly all, the civil and religious traditions of the origin of communities have been preserved in metrical language, because, this being an appropriate means of impressing on the memory what was worthy of remembrance, it must have supplied the place of writing in times when the latter art was unknown or little used.*

* The remote traditions of the origin and heroic age of communities are transmitted to us in poems, which appear rhythmical in language, and sententious in style. Although the learned Don Tómas Sanchez, opposing this idea, tries to prove that the books of Job and Genesis were originally written in prose, he does not succeed; because, not understanding Hebrew and Syriac prosody, he cannot well judge of the rhythm of those languages. On the contrary, taking into consideration the facts proved, and the analogous consequences deduced from them, we must needs believe that the books of Job and Genesis were composed in metrical language, because they consist of sententious versicles, which contain the idea within determined limits,—an art, perhaps, more difficult than that of versification, except when induced by versification itself. But when Sanchez stated his opinion respecting these books, he did not consequently prove that formerly there were not other works written in verse. The civilisation of the Hebrews and Egyptians was far too advanced for us to suppose that no other writings were then in existence, though they have not descended to us. Besides the enigmatical Veda of the Brahmins, the Persian traditions of the Ghebers, the Zendavesta of the second Zoroaster, the books of the Egyptian Osiris, and the Greek Orpheus, the Koran, and the Arab poems which precede it, appear written in metrical and sententious language. The Edda, the Voluspa, and the Havanna* strophes of the second Odin, the German Niebelungenlied, the Druidic and Celtic poems, and the Scotch ballads, which all belong to the civilisation of the north, and preserve its traditions,—all seem to be metrical works. If we descend to the relics of the middle ages, written in the *lenguas rústicas*, poetical compositions present themselves before prose. In the eleventh century appears a Portuguese poem on the *Perdida de España por el Rey Rodrigo*; in the twelfth, follows the Castilian *Cid*; and in the thirteenth, the poems of Alfonso el Sabio hold a prominent place. The *Cantigas* or *Lays*, and the *Provenzal tensidues* are of the date of the formation of nearly all the *lenguas rústicas*, and sustained their brilliancy until the crusade against the Albigenses destroyed the race of poets, and the language in which they composed. The works known to us, written in the Breton idiom of the province of Wales, and that of the Walones, much earlier than the book of *Bruty-Brenhined* (*Bruto de Bretaña*), belong to the end of the twelfth century and the beginning of the thirteenth. They are chivalric and genealogical poems, like *Rou* and *Florimon*, and others, in which are reproduced, though in an altered form, many of the Celtic and Teutonic traditions. No doubt historians, legislators, and other members of

* Probably the Hava-mâl, contained in the Elder Edda.—TRANSLATOR.

Cadence and harmony, and consequently versification and song, have been the first resource of nations for transmitting to posterity the oral traditions illustrated by the rude monuments of the earliest epochs, and for preserving their traditions, while as yet there was no alphabetical system.

It is an undoubted fact that the latter being invented, was first used to write in verse the works committed to memory, the importance of which was so much the greater that in them was deposited and arranged whatever was known of history, civil and moral laws, and even imperfect and struggling arts and sciences.

The primitive languages are always more sonorous and harmonious than those secondarily formed in each country, but climate having so great an influence on the delicacy of the organs, particularly those of hearing and pronunciation, the oriental tongues far surpass those of the north in the above-named qualities. Primitive languages being founded on the direct imitation of natural sounds, necessarily abound in imitative harmony. The peal of thunder, the noise of the torrent, the soft murmuring of the brooks, the sweet song of the birds, the roar of the lion, such were the first sounds imitated by men to communicate one to another the impressions they received and the necessities they experienced. Savage languages are full of prolonged, rather than articulate, sounds, and seem better qualified to depict to the imagination than to speak to the understanding. Thus it is not strange that primitive nations, according to the greater or lesser mildness of their climate, sooner or later discovered the metrical system by which, in various poems, they have transmitted to us their various traditions. Perhaps there might even have been in certain lands a social epoch, when, under the almost exclusive influence of imagination and a sonorous and harmonious language, it was easier to be poet than orator. If such an epoch there ever were, it must have drawn to its close in proportion to the progress of civilisation, when men's ideas, multiplying with their necessities, a greater mass of intelligence was developed, and they found themselves obliged to create words to express abstract ideas, whose perfect amysis exacted the sacrifice of imitative harmony to method and exactness.

The majority of the modern languages is derived from the Latin, but as these imitated the sounds of the words, and thus indirectly natural ones, they lost the rich and sonorous prosody of the original, and are wanting in the rhythm and cadence of its versification. Thus

the primitive communities, found a substitute for alphabetical characters in versification and harmony, and employed them to preserve the laws, doctrines, and more important facts, which, when writing was discovered, were transferred to it, the same form being retained in preference to any other.

failing in prosody, the modern tongues have been obliged to adopt, in poetry, a metrical system which founds its harmonic resources not on the measure and time of pronunciation, but on the determined number of syllables, the combinations of a certain periodical rhythm and the art of placing the accents.* Such are, in general, the bases of the modern metrical system, so essentially different to the ancient.†

Thus in Spain, as in all Europe, were established after the Gothic conquest, various jargons or *dialectos rústicos*, which, with the native languages anterior and posterior to the Roman domination, increased the number existing in each province (see note 2, p. 2). Such a multitude of tongues, no doubt, produced great confusion, and this contributed, in no slight degree, to prolong the existence of Latin. It is necessary to the populations and provinces which had adopted different idioms, to make them understood by each other. After our Peninsula was invaded by the Arabs, the language of the conquerors became common, and in the provinces they governed caused the decay of the others, Latin included. But this did not happen in those parts whither the Arab rule had not extended, or where it was only temporary; there the existing languages were preserved and perfected.‡ Among them I shall distinguish, on account of its connection with the subject of the present essay, the *lenguaje rústico* of Asturias, which afterwards, extended and cultivated with the reconquest of the provinces, became the dominant language of Spain.

Before Arab civilisation fell, the remains of the Roman and Latin, ceasing to be a living tongue, was only employed in writing the laws, public acts, and learned works. For this reason no document of ancient date in the Asturian dialect remains to us, since, though rapidly extended by the continued triumphs of the Christian arms, it was yet neither perfect nor exact enough to be used in public assemblies or in the transcription of contracts and legislative codes.

The poem of the *Cid*, the translation of the *Fuero Juzgo*,§ *las Par-*

* This was not fixed, with any degree of certainty, until the sixteenth century.

† Vitiated, corrupted, and even forgotten, as the Latin pronunciation was, they began to compose it in hymns; in which we find syllabic number and consonant sounds supplying the place of long and short. Perhaps this was the beginning of the formation of the new metrical system adopted by the modern languages.

‡ The Biscayan provinces, and part of Navarre, preserved a Celtic dialect; the Galicians and Portuguese formed theirs by the admixture of the Suevians with a more contracted Latin than that used by the Castilians; and the Catalonians and Valencians adopted the Provenzal with some modifications.

§ The translation of the *Fuero Juzgo*, of Cordoba, preceded and prepared the way for the work of the *Partidas*, projected in the reign of Ferdinand III, *el Santo*.

tidas, and the *Coplas* of Don Alfonso el Sabio, are the most remote written monuments to show us the state of the Castilian language at the end of the twelfth century and the beginning and middle of the thirteenth. The grace and boldness displayed in the style of the last two of these documents prove that the language must have undergone great changes before arriving at the point of flexibility and perfection in which we find it. It is impossible that it could have become so correctly formed and complete without having been previously cultivated by the learned, and others, in composing, if not in writing, works of much earlier date than those mentioned. It cannot be said with certainty whether these anterior works, the poem of the *Cid* excepted, were composed in prose or metre, but I am convinced that it was the latter, because people being obliged to trust to memory in the absence of writing, the object of preserving them would not be attained if suitable means were not employed. My conjecture rests upon the fact that the diction of the *Partidas*, polished, noble, and correct, already possesses the flexibility, harmony, and aptitude for good prose that languages acquire only after having been subjected to the turns and transpositions required in versification.

The irregularity and rudeness of the phrases, the want of grammatical sequence and connection between the ideas observable in the poem of the *Cid* induce me to consider it as an intermediate step between the *dialecto rústico* of the Asturians and the Castilian language of the thirteenth century. I have no hesitation, then, in looking upon it as a work composed in the twelfth century by a learned man of that time, who intended, though how little he succeeded is very apparent, to imitate Latin verse. In a word, I see in this poem* a progressive step taken by the language before the date of the *Fuero Juzgo* and the *Partidas*; but, considering its art and tendency to imitate models unknown to the *gente rústica*, I cannot consider it either the first production in the vulgar idiom, or look upon it as a specimen of popular poetry. Similar in style, but superior with respect to the latter point, we find the poems next in order, such as that of *Alijandro*, those of *Berceo*, and the *Archipreste de Hita*, which belong to a school imitating the Latin forms or the reminiscences belonging to them.

Besides, if we observe the slow march of nature towards perfection, we shall find that, notwithstanding the imperfect style and language of the *Cid*, we cannot imagine them to have arrived at even that point of cultivation without having been preceded by continued anterior

* In this historico-romantic poem, an attempt is made to imitate Latin verse; it is a pity that it is so badly executed. Notwithstanding its intolerable defects, the work has a certain candour, dignity, and interest which prove its author to have been a learned and, at times, an inspired man.

attempts, less studied and artificial, and better adapted for transmission to memory.

As the poem of the *Cid*, and others of its school, are wanting in the qualities proper to popular poetry, in those of another class, more easy, natural, simple, and remote, we must seek its original type. I say more remote, because it would be absurd to believe that from the point when Latin ceased to be a living language until the twelfth century, there were no songs of love and war, no hymns composed in the vulgar tongue, in which the people preserved, orally at least, their sentiments, fables, and history. We may therefore infer that the Castilian language and poetry began to progress seriously and uninterruptedly from the middle of the eighth century, when the independent Spaniards, who had taken refuge in Asturias, formed an established power and a true monarchy. In the time elapsing between the Arab invasion and the ninth century, several Christian states arose in the peninsula, and among others the kingdom of Leon was formed, consolidated and governed by Alphonso II. Then among his vassals began to be cultivated, made general, and established, that *dialecto rústico*, which afterwards, under the name of Castilian, became the principal language of Spain, triumphing over the primitives, such as the Biscayan, and the secondary tongues, like the Lemosino and the Galician, which were henceforward only spoken by the vulgar in certain determined districts.

The Catalonians and Arragonese maintained a treaty and communication with France and Italy, these countries having adopted the Provenzal language, which, older than the other *lenguas rústicas* and being also their precursor, was first perfected. Those people, consequently, became civilised before the Asturians, who, surrounded by inaccessible mountains, were able to maintain their narrow limits only by the point of the sword, and at the cost of much blood shed in cruel battles with the Moorish usurpers of the Spanish soil.* Some glimmerings of social culture undoubtedly appeared in the reign of Alphonso II. Already the valiant Asturians began to breathe freely within more extended frontiers, their kingdom was stronger and better regulated, and they were forgetting, with their fears, the concentrated hatred which at first made them reject all amicable treaty with the Arabs, and repulse the enlightenment, arts, and civilisation brought by them into Spain. Then the enthusiasm for glory was substituted with

* We should, therefore, consider Asturias the cradle of the national language and poetry, without any admixture of foreign imitation. The inhabitants of this province had enough to do in repulsing the Moors, who left them no time to study Virgil and Horace, nor to appreciate the literature of their enemies, the Arabs.

advantage for blind courage, springing from the necessities of offence and defence. The chiefs who led the Christian forces to the field of honour, returned to their homes laden with booty and objects of luxury taken from the enemy. As an action of thanksgiving to the god of battles, they made use of their riches in erecting temples and endowing churches, and employed the arts, imperfect as they were, in raising monuments of gratitude to the Supreme and Protecting Being, who had assured them the victory. By this time Latin was already almost unknown, and the vulgar tongue could not have remained more idle than the arts, it being very probable that while these were employed in ornamenting the temples, it was used by the soldiers and people to express their sentiments, celebrate their chiefs, and preserve the memory of their deeds in metrical language. We do not know what these songs were, none of them have reached us, but we may infer their existence, deducing it from the natural order and necessity of things. Remarking, however, the character, nature, construction, and style of the most ancient language of which traces remain to us, and comparing them with the *Bable** dialect still preserved among the Asturians, I presume that the primitive songs must have consisted of short verses whose intonation gave the exact number of syllables, and in which the liberty of lengthening or shortening them in pronunciation supplied the place of rhythm and true consonance. If the necessity of these supplementary means to a complete and fixed system of versification is made known in reading the poems of *Alejandro*, those of *Berceo*, and of the *Archipreste de Hita*, composed by men of talent, with how much more reason will it not be found in the popular, chivalric, and historic romances belonging to and made by the *gente rústica*, which, if I dare not place them in so remote an epoch as that of the birth of our poetry, I believe at least retains traces of this primitive form in which versification first arose among us. In them are preserved, if not the words, yet the construction and cadence of the Asturian *lengua rústica*, and in many parts we can even trace the dialect now spoken by the inhabitants of that province. Taking into consideration the

* Few provinces of Spain have preserved more relics and records of venerable antiquity than Asturias. Its dialect, known as the *Bable*, is sonorous, smooth, and, if not extremely rich, less poor than is sometimes believed. In the interior of Asturias, the same language is used as was spoken in Spain in the middle ages; and many phrases and expressions, preserved in the poem of the *Cid*, are familiar to the Asturian labourers. Those words which were acquired from the Arabs, did not pass the boundaries of the province. It would be a pity to allow a dialect to be lost, which, properly studied, might explain the etymology of many Castilian words, and whence we could supply ourselves with expressions we might be in need of, instead of borrowing them from foreign languages.

rudeness of some portions of the chivalric and historic romances, and returning to the impression they make on me, I am quite convinced, though I have no means of proving it, that they are fragments of works of still greater antiquity, which have descended to us intercalated with more modern productions.

LE HON'S FOSSIL MAN.*

THE science of Archaic Anthropology may be divided thus:—Subjects which the English understand and the French do not; subjects which are understood by the French and ignored by the English; and subjects which neither of them understand. It might be supposed that the third category would be the largest, but, on careful consideration, most heads are comprised under the second; whilst the first is a mere box for microscopical objects. For this reason M. Le Hon's excellent book will prove highly interesting to Englishmen, and will place them *au courant* with the present state of the subject on the Continent. The whole book (considered as an avowed compilation) is one of the most valuable practical contributions to Archaic Anthropology that has ever been published. Far more convenient in form, written in better language, and more systematic in arrangement, than Sir C. Lyell's *Antiquity of Man*, it forms one of the most instructive works we have ever read; and we discern with pleasure that the friend of the accomplished Director of the Bruxelles Museum, Dr. Edouard Dupont, has incorporated in this work all that is now known about what has been infelicitously named the "Antrology" of Belgium. The discovery at La Naulette of the famous pithecoid jaw (figured in this work), which is one of the most important *pièces justificatives* in the history of ancient man, was almost surpassed by the "find" in the *Trou Magrite* of the remains of cave-lion, which had reversed the usual order of things, and afforded sustenance for man. The Daniel who was in the lion's den at the Trou Magrite appears to have made a hearty meal on his equally carnivorous companions. We have rarely such valuable evidences of the customs of prehistoric man afforded to us; and we can only regret that, with the exception of Mr. Godwin Austen and Mr. J. Jones, so few English take much interest in Belgian discoveries. We trust that the investigation which was inaugurated by the Anthropological Society of London in 1866, acting in co-operation with Dr. E. Dupont, will

* *L'Homme Fossile en Europe; son industrie, ses mœurs, ses œuvres d'art.* Par H. Le Hon. Second edition, Bruxelles, 1868.

not be allowed to be altogether forgotten. The specimens upon which the antiquity of the human race can be most conveniently tested are those from the Belgian caves. The Aquitanian relics are of late date, and less value. The most important are those from Bruniquel, described by Professor Owen some time ago before the Royal Society, but of which the description is as yet unpublished. Some others are being described in the work published according to the will of the late Mr. Christy, including contributions by M. Lartet, the prince of French palæontologists, edited by Professor Rupert Jones. There has been certainly too much said about this work.

It has been several times attempted by the Rev. Dunbar Heath, to identify in some way the Aquitanian cave-dwellers with the "mute men," which, according to his theory of the origin of language, preceded the Aryan races in Western Europe. But when we examine the cranial characters of the skulls from Les Eyzies, we have no ground whatever to infer that they were destitute of language. It seems, moreover, improbable that a race which, on the whole, appeared to have possessed a considerable amount of knowledge of elementary art should have been destitute of language. It seems also scarcely logical to identify the "mute men" (if they ever existed) with the race of Aquitaine, any more than with the more pithecoid and apparently more degraded individuals who lived at La Naulette and at Arcis. If either race was mute, the most pithecoid and the least civilised should be chosen, in preference to the cave-dweller of Aquitaine, with his artistic skill and his vaulted cranium. The ages of the high level and low level gravels of the Somme valley are, since the publication of Mr. A. Tylor's paper before the Geological Society, exceedingly doubtful, and, for this reason, we refrain from synchronising the low level gravel with any of the French deposits.

M. Le Hon's introductory words give a general view of the present state of the science, as well as of the problems the scientific man has to solve. We are sorry that he should have thought fit to introduce the question of the derivation of the human race from the apes so early in the work as the twenty-ninth page, but have no doubt that his analysis of the subject is as valuable as that of any other previous writer, which is by no means too extravagant an encomium. A history is given of the mode by which the flint implements which, since the time of Mr. Frere, of Hoxne, have attracted so much attention, have been made: and the conditions under which cavern deposits have been accumulated are carefully laid down. We would commend this part of the work to all those who, like M. Desnoyers, have any doubts about the authenticity of certain cavern remains. It is true that in the infancy of the science various caverns (as *e.g.* Kirkdale)

Faunas.	Ages.	Human Industry.	France.	Belgium.	Stratigraphy of the Belgian Caverns.
Existing species.	Age of Polished Stone.	Instruments of Polished Stone.	*"Aryan" skulls.* Dolmens, etc.	Entrenched camps. Sepulchral caverns, etc.	Beds which are forming at the present day.
Emigrated species and Existing species.	.....	Flint knives and worked bones: without sculptures.	....	Furfooz—*"Turanian" skulls, Ligurian type.* Chaleux.	"Limon hesbayen" (Loess). Deposit with angular pebbles (diluv. rouge).
		Flint knives and worked bones: with sculptures.	La Madelaine. Les Eyzies—*Dolichocephalic skulls.* Laugerie basse.	Marches-les Dames.	
Extinct species.	Mammoth Age.—Reindeer Age.	Worked flints, with small splinters on the two faces.	Laugerie haute.	Pont-à-Lesse (upper bed).	Excavation of the valleys. Limons fluviatiles and rolled pebbles.
		Worked bones.	Solutré.		
Emigrated species and Existing species.		Triangular flints worked on one face.	Moustier.	Pont-à-Lesse (lower bed).	
		Haches worked on both faces.	Gorge d'enfer.	Montaigle.	
		Coarse pottery.	Aurignac, etc.—*Human remains, type undetermined.*	La Naulette, etc.—"Pithecoid" jaw of exaggerated "Slavonian" type.	
		Worked bones.	High level gravels of Somme valley.		

were imperfectly described. It is also true that since that time French geologists have thoroughly laid down the conditions under which the age of various deposits in caverns can be comprehensively synchronised and referred to various and definite ages, according to the relative percentage of extant, emigrated, or existing species they may contain. English palæontologists have fallen into the wake of the French, and have bit by bit accumulated such evidences of patient research as Mr. Pengelly, in his celebrated Kent's hole exploration (under the auspices of a committee of the Royal Society) has presented.

With regard to the Moulin-Quignon jaw, M. Le Hon prudently relegates it to an obscure note at the end of a chapter, and does not commit the error common to too many French palæontologists of playing off the Moulin-Quignon jaw as a trump card in the controversy on the antiquity of man. He does not exhibit similar prudence respecting the Neanderthal skull, of which we have here a long account.

The whole chapter on the Man of the Mammoth and *Ursus spelæus* period is most interesting. The skulls of Engis, Eguisheim, Olmo, and Neanderthal, and the jaw of La Naulette, are carefully described. As the Olmo skull is scarcely known amongst Englishmen, we translate M. Le Hon's description:—

"M. Cocchi, of Florence, considers this to be anteglacial and more ancient than the Abbeville jaw. It was discovered in a railway cutting at Olmo, not far from Arezzo. This skull was at a depth of fifteen metres in a bed of lacustrine marl, which presented no trace of disturbance. This clay, of a level higher than that of the Arno alluvium, ought to be very ancient. It is surmounted by a bed of sandy gravel (ghiaie), by ancient and modern alluvia, and by vegetable earth. Near the skull was found a kind of flint *hache* or lance-head, chipped with large facets. At two metres above there was collected the tip of an elephant's tusk. These human remains seem rather to complicate the great ethnological (*sic*) question than to throw light upon it. The form generally classes the skull amongst the dolichocephali; the broad, low, and angular forehead in nothing resembles that of any fossil crania discovered up to the present time. M. Vogt, who has examined the Olmo skull, says that he does not know anything similar in ancient craniology. The anterior part of the skull is much depressed, whilst the occipital portion offers a considerable development. On the whole, especially in the posterior portion, the Olmo skull appears to resemble more the Negro type than that of any other race."

The woodcut given, however, which exhibits a profile view of this skull, does not present any such remarkable peculiarities as those which M. Vogt seems to infer. It would, of course, be hazardous to infer from the profile view alone the considerable resemblance which this skull seems to bear to those, *e.g.* of the Borris and Blackwater river

beds, which exaggerate the extreme dolichocephalic type of the Dorsetshire long barrows and of the apostles' skulls of Switzerland. As, however, M. Vogt commits himself to the theory that the Olmo skull is *sui generis*, it would be unwise to contradict him on the mere ground of the resemblance the woodcut appears to bear to other and previously described dolichocephali. M. Le Hon argues in detail the question whether early man was cannibal. He quotes the discoveries of M. Spring in the cave of Chauveau, in Belgium, and M. H. De Ferry at Solutré, in the Maçonnais, which certainly bear out the theory. We are sorry to see, however, Mr. Laing's alleged discoveries in Caithness alluded to, and the scraps of mica-schist, which the ex-M.P. for Wick imagined to be works of human handiwork, described as "*silex!*" It is hardly necessary to say that no flint exists in Caithness.

The principal caverns of the age of the *Ursus spelæus* and of the Mammoth are the following:—Grotte de Vallières, De la Chaise, Grotte des Fées, Trou de la Fontaine, Sainte-Reine, Pontil, Moustier, Vergison, Massat, Kent's hole. A great deal of confusion has arisen by confounding these caves, which are of great antiquity, with the other ones of the reindeer age. These are also described by M. Le Hon in detail.

The account which is given by M. Le Hon of the caves of the reindeer period is especially valuable: and gives a far better account of them than in any book we have yet examined. Those described are Massat, Bise, Savigné, La Vache, Bruniquel, Des Eyzies, De la Balme, Bethenas, Chaleux, and Solutré, few of which have been described in English works on Archaic Anthropology. At the termination of this period took place that submergence of a large portion of northern Europe, during which the *Limon hesbayen* of Dumont was deposited. The waters in Belgium, according to M. Dupont's observation, attained the height at the epoch of the red drift (*argile jaune à blocaux*) of at least 250 metres.

We pass over a large portion of the work relating to the polished stone and bronze ages, inasmuch as our readers are already familiar with this period, which has been sufficiently described in English works. The analysis here given, however, is most valuable and comprehensive. At the conclusion of the work, however, is an epizoon, which rather detracts from its merits; *i. e.*, an abridgment of the theory of Darwin, or "Transformism", translated from the Italian of Prof. Omboni, with prolegomena by M. Le Hon. This has absolutely nothing to do with the work itself; and we regret that so much space has been wasted on discussing elementary Darwinism, of which we have had quite enough. Whether "Darwinism", or "Derivation"* be the real method by which the various living beings

* Owen, *Comparative Anatomy of Vertebrates*, 8vo., Lond. 1868, vol. iii.

on the globe have been created, matters at present very little; and has nothing to do with the question of "Fossil Man." If M. Le Hon had called his book one on the Origin of Man, the appendix would have been justifiable and necessary, but as it stands it is a blemish which we hope to see removed in the third edition. Belgium, however, in which country the most important evidences of the origin of man have been discovered, has just cause to be proud of the present work.

ANALYTICAL ACCOUNT OF THE CHIEF CHARACTERS TENDING TO SEPARATE MAN FROM ANIMALS.*

By M. Rochet.

Man cannot be defined, as many naturalists have attempted, by a sacramental phrase. His distinctive characters are multiple, and it is by their ensemble that we are enabled to understand him; he is a summary of all living beings, in some respects the conclusion; and his infancy has not yet terminated. From our point of view man may be considered under five principal heads:—

1. *Man examined externally as regards form.*—There is not a single feature in the human face which, examined from an artistic stand-point, does not constitute a character of beauty and nobility foreign to the animal. He alone has an expressive and intelligent physiognomy. This applies also to the body. Thus the trunk of man is both supple and flexible; it rotates on itself in a manner observed in no other animal; like the head the body is of incomparable beauty, and shows a harmony of proportion not observed elsewhere." The erect stature, the perfection of the hand, and of the foot, are characters of the same value. The hand is especially characteristic. Man alone has a true hand; he alone uses this admirable instrument for creating thousands of industrial and artistic masterpieces.

2. *The internal, sensitive, or moral man.*—Man is endowed with a moral sensibility altogether unknown to the rest of organised beings. Everything affects and agitates him. He loves, or believes in things animals have no notion of. He possesses the feeling of the beautiful, the ugly, of wrong and right. He alone is conscious of the morality or immorality of his acts. He alone in the whole universe is conscious

* Translated from the *Bulletins* of the Paris Anthropological Society. This is the summary of the author's important memoir on this subject.

of his existence, of that of the universe, of extension of space and duration. He knows that he is born, lives, grows old, and dies. Animals know nothing of all this. They feel that they will, but do not know it.

Man alone has an idea of God, and is attached to him by feeling and intelligence. By intelligence man arrives slowly at the idea of God. This one of those sublime abstractions which form the glory of human conceptions.

Considered in his social relations, even the most primitive and necessary, man alone of all animated beings forms a complete family, proceeding from the ascendant to descendants and collaterals. The animal takes life as it finds it without any way modifying it. Man, on the contrary, takes life according to his will; for all the regions on the globe form part of his domain; and he can in a thousand ways vary the mode of his existence.

3rd. *Man considered as an active being.*—Even in satisfying the lowest appetites, man differs from animals. He alone prepares his food by cooking it. Man alone provides himself with clothes to protect himself from the elements. When we treat of industry, instruments, and arms, the difference is enormous. The animal has no other weapons than those given to it by nature; man furnishes himself with a rich arsenal, and this aptitude he possessed when he first appeared upon the earth, as taught us by Archæology. Man finally possesses another important character, articulate speech. Where there is no word there is no idea, no thought, no intelligence. The extensive language of animals consists of simple interjections.

4th. *Of Man considered as an intelligent being, or of the faculties of the human mind.*—Animals possess in principle the same intellectual elements as man, but in a rudimentary state, so rudimentary that all comparison is impossible. Like ourselves, animals possess memory, or rather a memory, a faculty which is the basis of every intellectual operation. But in them it is a faculty founded only on wants, personal utility, without any true notion of the objects; whilst in man who, by means of language, acquires ideas, the facts of memory acquire great value. I have no intention of defining memory, but I estimate that a human brain may well contain from 300,000 to 400,000 images of things. Thus the memory of a philologist may contain more than 100,000 words without counting the variations, flexions, etc. The animal possesses nothing analogous to the free will of man. The choice of an animal is not a real deliberate choice; it is a simple option comparable to the decisions of a very young child or of an idiot.

The animal entirely wants imagination. I take this word in its poetical sense. It does not possess this faculty so precious for man's

happiness, the charm of life, the consolation and the remedy for his evils.

5th. *Man considered as a collective being.*—I merely here indicate how much man is superior to the animal by the mode in which he occupies the soil. The animal constantly loses territory which man gains. The day will arrive when there will be on the surface of the earth only such animals as are useful to man. The chief reason of man's great superiority over the animal is his faculty of association. Animality has no principle of cohesion in its members. Every animal lives only for itself. But men group together and combine their forces, and, although individually weak, they acquire an immense power. Man transmits his works and his conquests to his descendants. The animal perishes and leaves only his skeleton behind. And if man has frequently deified himself on the earth, it is because he found nothing on earth that can be compared to him.

BURTON'S EXPLORATIONS IN THE BRAZIL.*

THOSE anthropologists who, in the summer of 1865, watched the departure of Capt. Burton for a new and, to him, hitherto untrodden path of scientific travel, have waited long for the publication of the great work which should comprise his "experiences" of South American anthropology. The practical knowledge of man, alike in his highest and in his lowest aspects, which he had previously gained in India, in Arabia, in the Rocky Mountains, in Eastern Equatorial Africa, at Fernando Po, and in Dahome, naturally in a great degree qualified him for South American research. Now, however, we have the satisfaction of knowing that he has been promoted to a new field of labour in Syria; we doubt not that he will find that Abana and Pharphar, rivers of Damascus, are as much productive of anthropological fruit as even the São Francisco.

Glancing over the two enormous and closely printed volumes before us, we are utterly at a loss how to commence our criticism. Nearly every part of the work is a minute photograph of the country, the people, and the productions of the Brazil. A careful study of the

* *Explorations of the Highlands of the Brazil, with a full account of the Gold and Diamond Mines; also, Canoeing down* 1,500 *miles of the great river Sao Francisco, from Sabará to the sea.* By Captain Richard F. Burton, F.R.G.S., etc., Ex-President Anthrop. Soc. London, 2 vols. Tinsley Brothers.

authorities cited by him (made, we may parenthetically say, before Captain Burton's visit to the Brazil, and without any reference to the present work) has led us to the deliberate and mature generalisation that the present is one of the most important works on the Brazil ever published, and worthy to rank with Spix, Castelnau, or Neuwied. We shall commence with a few remarks on the subjective nature of descriptive anthropology.

Those who have themselves been in the tropics, and have watched the various modes in which the intrudent or colonising European population have assimilated with the physical features of the country, are able to appreciate the truth of the following remarks:—

"The first impression made by our Transatlantic cousins, speaking only of the farmer and little educated class, is peculiar and unpleasant. In them the bristly individuality of the Briton appears to have grown rank. Their ideas of persons and things are rigid, as if cast in iron: they are untaught, but ready to teach everything. Each one thinks purely and solely of self, from the smallest acts and offices of life, such as entering a room or sitting down at meals, to the important matter of buying land or of finding a home. All have eyes steadily fixed upon the main chance; every dodge to get on is allowable provided that it succeeds, and there is no tie except of blood, to prevent at any moment the party falling to pieces. Amongst themselves there is no geniality; of strangers, they are suspicious in the extreme, and they defraud themselves rather than run the risk of being defrauded. Nothing appears to satisfy them; whatever is done for them might have been done a 'heap deal better.' As the phrase is, they expect roast pig to be run before them, and even then they would grumble because the crittur was not properly fixed for them. This is not an agreeable account of the pioneers now leading the great Anglo-American movement in the Brazil. Yet we presently find out that these are the men wanted by the empire to teach practical mechanical knowledge, to create communications, and to leaven her population with rugged northern energy. Bred in a subtropical country, seasoned to fevers, and accustomed to employ Negroes, they will find the Mediterranean Brazil an improved edition of their old homes. Nothing is to be said against the German in this country, except that he is too fond of farming, as he often did in the United States, an *imperium in imperio*; moreover, his political ideas are apt to be in extremes. The Frenchman, like the Portuguese, comes out empty, as the old saying is, and goes back full. The Englishman, except under Morro Velho discipline, languishes and drinks. As regards bodily labour, he is inferior to the Negro. The Scotchman prefers great cities. The Irishman has been hitherto found unmanageable, but under the Anglo-American, who knows so well how to drive and manage him, he will be a valuable hand, the muscle and the working power of the country."

There are more truths in this passage than the Saxon Englishman

will care to admit; as a whole, it must be admitted that Anglo-Saxon emigration to, and acclimatisation in, the tropics is a failure. It was well suggested by Dr. Hunt that the men who are sent to the tropics should be selected in temperament, and that those should be preferred who appear to have temperaments most suited to the climate. This is so far so good. But we think that Dr. Hunt himself would not object to a further and more minute racial selection. We think ourselves that the Celt is the race *par excellence* for the tropics. The Saxon Englishman is too apt to suffer from nostalgia. "Vaterland," the "cottage homes of England," depraved, wretched, and degraded though they may be, have unspeakable charms for the Saxon. In the tropics, with their glorious soul-revivifying noonday sun, their calm and placid evening twilight, and their sharp "four o'clock in the morning" sensation of a delightful cool breeze, the Saxon finds no sources of enjoyment. The charms of scenery and climate, the new sensations of association with semi-savage life, and with a newly-spoken language, afford to him neither amusement nor consolation. He misses mutton, Protestantism, and beer; the *tortillas*, *carnê seco*, and *aguardiente* of the natives are at first repugnant to him, yet little by little he falls under the influence of the last named fluid, and the observant anthropologist sees the "unready Saxon" a moping, lazy, dissatisfied drunkard. Happily for his neighbour, there is a remedy, and the proximate epidemic speedily removes the lazy lout who has been imported into a land which is to him the reverse of Paradise.

It is far different with the Irishman or Frenchman. They have no social prejudices against associating with the Spaniard, and rapidly assimilate their diet with that of the native. So long as the Celt has work wherewith to feed his mind, the natural elasticity of his spirits precludes him from despair, and his inborn sense of honour, discipline, and veracity will render him susceptible of sensations which go far to make the apparently monotonous life in the tropics bearable. The writer (no phrenologist in the vulgar sense of the word) cannot but contrast the brains of the Celt and the Teuton. The enormous perceptive faculties of the first, coupled with his large basilar development, prefigure his power to observe and to enjoy surrounding nature, and to maintain vital force. The second has height and breadth, volume of voice, and rapidness of deduction; as an inductive observer, the Teuton is simply nowhere, and in the Brazil he finds his level. It is so wherever we witness him. The flaxen-haired, fat, jolly, "sonsy" Anglo-Saxon, when contrasted with the wiry, intellectual, revengeful Celt, sinks into immeasurable inferiority. He tries to impress the natives with an idea that he is an Englishman, pays poor rates, and eats meat three times a-day; he challenges them or his

Celtic superiors to pugilistic encounters; and it is a relief to suffering humanity when a *cuchillada* ends the contest.

But to revert to the Brazil. It being admitted, not merely upon the showing of Capt. Burton, but upon the testimony of long experience, that the native of Southern Europe sympathises with, and assimilates to the native of America more than does the native of the later and lesser civilised nations of the north, let us examine what are the physical changes which his organisation undergoes. When a healthy European is for some time a resident in the Brazil, what differences are perceptible between himself and descendants on the one hand, and on the other hand the issue of the same parents in localities closely adjacent to their own ethnic centre? The passages in the present work bearing reference to this question are numerous. We can only here select one of the more striking passages, referring, not merely to the mixed breeds but also to the Creole descendants of European parents. Apparently, according to Capt. Burton's theory, a greater deviation from the European type exists than is the case in Central America. For this we were prepared, remembering that in Central America the Negro blood forms a very small proportion of the mixed race, which is there almost entirely (except on the Mosquito coast) composed of white and aboriginal elements. In fact, the Brazilians are piebald, whereas the Central Americans are merely skewbald.

"The skull is generally dolichocephalic, and it is rather coronal than basilar; rarely we find it massive at the base or in the region of the cerebellum [a great contrast to the Indians of the Western Coast] the sides are somewhat flat, and the constructive head is rare as a talent for architecture or mechanics. The cranium is rather the 'cocoa-nut head' than the bull head or the bullet head. The colour of the hair is of all shades between chestnut and blueblack; red is rare; when blonde and wavy, or crisp and frizzly, it usually shows mixture of blood; it seldom falls off, nor does it turn grey till late in life—also a peculiarity of the aborigines. With us the nervous temperament is mostly known by their silky hair; here we have the former accompanied by a 'mop.' I have heard Englishmen in Brazil declare that their hair has grown thicker than it was at home; so Turks in Abyssinia have complained to me that their children, though born of European mothers, showed incipient signs of wool—they invariably attributed it to the dryness of the climate. Though hair in the Brazil is, indeed, an ornament to women, it seldom grows to a length proportionate with its thickness. The deepest eyes are straight and well-opened; when not horizontally placed there is a suspicion of Indian blood; the iris is a dark brown or black, and the cornea is a clear blue white—not dirty brown, as in the Negro. The eyebrows are seldom much arched, and sometimes they seem to be arched downwards; the upper orbital region projects well forward. The

mouth is somewhat in the 'circumflex-accent shape;' and the thin ascetic lips are drawn down at the corners, as in the New England and the asthmatic sufferers in England. The teeth, of dead white, are unusually liable to decay; they require particular attention, and thus the dentist is an important person. Young men of twenty-five sometimes lose their upper incisors, a curious contrast of old mouth and young hair. The expression of the Mineiro's countenance is more serious than that of the European. In his gait, the slouch of the boor is exchanged for the light springing step of the Tupy. Hence he is an ardent sportsman, and the country squire delights in hunting parties, which extend from a week to two months. The nomad instinct is still strong within him, and he is always ready to travel; curiously enough, foreigners blame this propensity, and quote the old proverb about the rolling stone. All are riders from their childhood, and, like the northern backwoodsmen, they prefer the outstretched leg with only the toetip in the stirrup; this, they say, saves fatigue on a long journey; moreover, as they sit by balance, they can easily leave the animal when it falls. Our hunting seat and the hitched-up extremities of the Mongol would be to them equally unendurable.* It is to be observed that all the purely equestrian races ride either as if squatting or standing up; and both equally abhor what we call the *juste milieu*. Like the Bedouin and the Aborigine of the Brazil, the Mineiro is able to work hard upon a spare diet, but he will make up manfully for an enforced fast. Self-reliant and confident, he plunges into the forest, and disdains to live with others, and to cling in lines to the river bank."

Such is the Brazilian, *fide* Burton; and a description like the above will, we think, rarely be matched in the whole range of our literature of descriptive anthropology.

If we turn to the records of the past, what evidence is given us of prehistoric, or even of ancient existence in the Brazil? The appendix to the present work gives us a series of interesting facts, extracted from the *Revista Trimensal* of the *Instituto Historico e Geographico Brazileiro*, and which contain an account of a large, hidden, and very ancient city, without inhabitants, discovered in the year 1753. For interest we may say that this recital surpasses Stephens, and rivals Squier. For it gives us the account, for the first time in anthropological literature, of a mighty buried city in the mountain fastnesses of the Brazil, as well as five separate inscriptions which have been deciphered from these monuments. We are not ourselves about to offer any interpretations of these inscriptions. There has been quite enough nonsense printed during the last few years on the "Palæo-

* *Note by Reviewer.* What a contrast, however, is afforded between the short stirrups of the Central American *Mozo*, doubtless inherited from his Mauro-Spanish civilisers, and the long stirrups of the Texans and Californians, the descendants of the *rejectamenta* of Europe, who were never equestrians. The typical English jockey, or huntsman, however he may be *in medias res*, is far from being a model. The "cavalry seat" is, of course, wholly unsuitable to the practical man.

graphy of the New World" for us to wish to add one single shovelful of dirt more to the heap which has been already accumulated. Besides, "Maya alphabets" have had their day. But we may as well hint that the letters of the first inscription κνφιξ, have an unpleasantly Greek appearance, although they are to us unintelligible; whilst the Greek cross for three, the Latin cross for five, and the Arabic 5 for seven, make us a little suspicious that the inscription contains the scratchings of some joker. We have seen such things done before now. The little bit of Chinese, or Maya, or gibberish which is put in to represent the figure 8, does not shake our opinion. Nevertheless, we cannot but admit that the article in question may throw important light on the history of the early inhabitants of the Brazil, and we think that Mrs. Burton's plea for indulgence in favour of her excellent translation of the memoir may be frankly admitted. Few Englishwomen would have so easily mastered the difficulties of the language.

The passages in the present work relating to the gold mines of the Brazil are very important, especially in an anthropological sense, as it shows to what success British emigration to that country may be successful when the miners are under proper discipline, and when a large proportion of the men are permitted to have their wives with them. We are certain that the true civilisation of the tropics will be effected only when a certain proportion of European women are imported, to form the nucleus of a future white population. This pure white population—"Creole" in the literal sense of the word,—will extirpate the atrocious "mixed breed" that now crawls, like a disgusting reptile, over the fair face of the Brazil. Whether the best element to form the Creole population is Teuton or Romano-Celt, we have hinted above. In "rugged northern energy" we have no confidence whatever. Even the Teuton, however, is mentally and morally the vast superior over the cowardly, thievish "Ladino;" and when we glance at the miserable fate of our houseless, homeless poor in England, we cannot but hope that they may be induced to settle in a land where starvation, at least, is impossible. The formation of mixed breeds, however, is a direct social vice. Apart from all laws of morality with which we, *quâ* anthropologists, can have no immediate concern, we consider that any white man who aids in the production of a "mixed breed," should pay a fine of (say) twenty-five dollars to the civil authorities for deteriorating the population of the country. This may, at first sight, be thought severe; but white men should learn to restrain their passions, and refrain from producing a race prejudicial to the wellbeing of the state. The use of inoculation, and the spread of the rinderpest, have been checked by European law, without any regard to the feelings of the parent or

of the cattle-owner; and there is no reason in ethics or in law why the mixed breed should not be "stamped out."

The weight of the pure blood Brazilian is estimated as about 128 lbs.; and, according to Capt. Burton, he is rather wiry and agile than strong and sturdy. Hence, the Brazilian calls himself "Pé de Cabra," or goat-foot, opposed to the Portuguese, who is "Pé de Chumbo," foot of lead. We must commend the whole chapter on the Physical Man of Brazil to our readers, as it gives a far clearer notion of the population than any other work we remember. Capt. Burton certainly has a power of throwing himself into his subject, which no other modern traveller seems to possess. He has the vividness of Russell, without his occasional dulness; the minute description of G. A. Sala, without his vulgarity; and the accuracy of a photograph, without its deviation from focus. For to him anthropology is the focus around which all other sciences sink into distant perspective; and if (to pursue the metaphor) he focusses too vividly now and then, so as to show the dirt-spots and the patches on the dress of his object, we have, after all, but an exact picture.

The dedication of the work is to Lord Stanley; and we are glad to see that Capt. Burton signs himself "Ex-President of the Anthropological Society of London,"—a title which, in itself, is far more high than most of those commonly adopted in dedications. Mrs. Burton's preface is itself a model of good common sense; and we are very glad to see that she appeals to the *gentle* sex not unduly to misjudge the present work, on account of the import of certain expressions used by the author, and which, perhaps, offend against the prejudices of the ignorant English public. Our own views with regard to the "religious and moral sentiments, which belie the good and chivalrous life" of Captain Burton, closely agree with those of the fair author of the preface, who has guided the delighted reader very well through the "anthropological sandbanks and hidden rocks" she appears to have noted, during her sojourn in the Brazil with her illustrious husband.

CARL VOGT'S LECTURES ON MAN.*

PROFESSOR CARL VOGT is styled by his countrymen the Darwin of Germany. Whatever resemblances there may be between these distinguished men of science, there is one important distinction to be borne in mind: Mr. Darwin has not in his great work on the Origin of Species directly applied to *Man* his theory of natural selection. That Darwin has not done so is dwelt upon by many as evidence that the illustrious naturalist never intended to imply man's origin by transmutation from some other animal, and his followers are censured for making him answerable for such a conclusion. (*Vide* Speech of Dr. Duncan on Mr. Dendy's Paper, Nov. 3, 1868, in J. A. S. L.) But as Mr. Darwin has not made man an exception to his theory of origin of species in general, it is utterly impossible to deny that the transmutation doctrine must involve man; *e.g.*, in the sweeping admission that *all* existing animals have descended from, at most, only four or five progenitors; and that analogy would even lead to the inference that "all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was at first breathed." Vogt, on the contrary, deals directly with man's origin, and, applying the hypothesis of Darwin, pushes it to its utmost limits. Those who still think that Darwinism permits man's genesis to be an exception from that of other species should read Professor Vogt's Lectures. That is not a difficult task to the student of scientific truth, whatever it might prove to the old-fashioned opponent of development. Thanks to the English Editor, this work may now become as popular in Britain as it is in Germany; a more charming work of science, and one better deserving of popularity, it would be difficult to find. It exemplifies the profundity and thoroughness which are characteristics of the German mind, with a lucidity of style which is not always a characteristic of German literature.

It would be obviously impossible in the limits of a brief notice, like the present, to go over the immense field of thought traversed by our author in sixteen lectures, comprising a volume of 469 pages, profusely illustrated with excellent woodcuts. Having to choose amid such an *embarras des richesses*, I shall confine myself to that portion of the

* *Lectures on Man, his place in Creation and in the History of the Earth*, by Dr. Carl Vogt, Hon. Fellow of the Anthropological Societies of Paris and London; Edited by James Hunt, Ph.D., F.S.A., F.R.S.L., &c. London, Longman & Co.; pp. 475, with 125 woodcuts; price 16s.

work bearing immediately on the profound and interesting question—the ancestry of the human species. If the genus *Homo* wishes for information on this point, Professor Vogt is quite ready to impart it in his Preface. Dr. Hunt observes: "Professor Vogt acknowledges that, to a great extent, he is willing to accept the conclusions of England's great modern naturalist Charles Darwin; but, unlike many of that profound observer's followers in this country, he entirely repudiates the opinions respecting man's unity of origin, which a section of Darwinites in this country are now endeavouring to promulgate. "In this I concur. It appears to me quite consistent with Darwinism to believe in unity or plurality of human origin. The Darwinist may be monogenist or polygenist. I have expressed these views in a paper written before I had made acquaintance with Professor Vogt's work."*

In lecture six we have an elaborate comparison of man with the ape. Our author shows the fallacy of the popular idea that man is the only defenceless animal. The chimpanzee is equally unarmed; yet the chimpanzee has not become one of the lords of creation. The sheep butts with its hard skull; so does the Negro.

The advocates of generic distinction between human and simian brains point out that in man the convolutions are rounder, more complicated, more numerous, and less symmetrical. All very true, says our author, but these are only relative and quantitative, not qualitative differences. The general plan is and remains the same; this is proved by drawings of human and simian brains. Let the reader compare the drawings of the brains of the Hottentot Venus, Gauss, the celebrated mathematician, and the orang, pp. 184, 185. There is a greater similitude in the Hottentots and simian brains than in the two human brains. This appears fatal to the theory of a separate order and kingdom for man, based on a supposed fundamental diversity in brain structure between the genera *Homo* and *Simia*. In both the generic division of frontal, parietal, posterior, temporal lobes, Sylvian and other fissures correspond. We must agree, with Gratiolet, that "there is in man and ape a peculiar cerebral form; also in all these creatures a general type in the arrangement of the cerebral convolutions. This resemblance of man and ape in arrangement of the convolutions is worthy the attention of the philosopher. There is equally a particular type of the cerebral convolutions in bears, cats, dogs, makis, in short, in all natural families. Each of these families has its normal type; and in each of these groups the species may be connected solely according to the character of the cerebral convolutions."

Our author proves that: "The difference between the brains of the

* See Paper on "The Ape-Origin of Mankind," *Pop. Mag. Anthropology*, October, 1866.

microcephalus, an abnormally formed man, and that of the lowest race, the brain of a Bushman's wife (which, according to Gratiolet, would have produced idiotcy in a white man), is greater than the difference between the idiot's and ape's brain. The idiot who has remained stationary in a primary stage, stands nearer to the ape than to his progenitor; the distance which his brain has to pass to perfect human development is greater than the distance it has passed from the simian stage" (p. 170). Professor Vogt "does not hesitate to uphold against Bischoff and Wagner, and even against Johannes Müller, that microcephali and born idiots present as perfect a series from man to ape as may be wished for;" and gives us further interesting details from a comparison of twenty cases of congenital idiotcy:

"This is an arrested brain growth, chiefly affecting the anterior portion. Development is slow, such individuals learning to walk only in the fifth or sixth year. These idiots are frequently, though not always, dwarfs, like the Aztecs. The stooping walk, with curved knees, resembles that of the ape, causing them to appear shorter than they are. They usually die early. The impression produced by them is decidedly simious, or that the authorities even describe it as such. The arms seem disproportionately long, the legs short and weak; the head is that of an ape, the skull-cap is covered with thick woolly hair; the forehead nearly absent; the eyes stare from projecting orbital margins; nostrils wide; lower portion of the face muzzle-shaped; the teeth obliquely set. The head is disproportionately small in comparison with the body, viewed in profile the face occupies as large a space as the cranium. The large osseous pad above the root of nose, the projecting jaws, the facial angle of about 53-56 deg.; all these characters are decidedly simious. Viewed from below, the large occipital foramen situated farther back, the long parabolic palate, the open basilar suture, as well as traces of the intermaxillary suture, all these strike us as animal characters. We need only place skulls of Negro, chimpanzee, and idiots, side by side to show that the idiot holds, in every respect, an intermediate place between them.

He summarises idiotic forms thus: "In their brains and skulls resemblance to the human standard has been diminished by arrested development of anterior cerebral lobes, and only the secondary human character preserved, in the serried set of teeth and projecting chin." He asserts that "If a microcephalic skull were found without a lower jaw and an upper row of teeth, *every naturalist would at once declare it to be the cranium of an ape*, as in such a mutilated skull there would not be found the least characteristic mark which would justify an opposite inference." This, perhaps, is going too far; certainly the assertion does not appear to me to be borne out by the drawings of the idiot and chimpanzee skulls.

He then glances at the vital phenomena of idiots: "There are

scarcely any sexual manifestations; movements rapid but unsteady; walk tripping. Many never learn properly to use their hands; they exhibit a restless activity; attention excited and as quickly obliterated; memory defective; they are fond of play, but cannot learn the amusements of children; they are tolerated like domestic animals, manifesting their wants by shrill sounds, understood as the hunter distinguishes the cries of animals, &c. Few acquire articulate language: the Aztecs pronounced some few words they had learned." Leubuscher says of the Aztecs: "They possess memory for such things as greatly excited their attention, for persons who had been long about them. When I measured them the boy recollected earlier proceedings of this kind. After the lapse of eight days he well recollected the previous process, so that on my questioning him what I had done, he described the lines round his head; but, having interrupted my visits for several days, he had forgotten me and all the rest, as had also the girl. The extent of their intellectual capacity does not surpass that of an eighteen months' child, and, may be, falls below it. What we call ideas they probably do not possess, as this degree of intellectual development can only be formed upon the basis of individual self-consciousness." Vogt speaks of the so-called Aztecs as mulatto dwarfs; it is curious to compare with the opinions of scientific men the newspaper puffs and flourishing articles about the time of the first exhibition of the Aztecs in London, and their recent receptions after marriage in 1867. As I am not like a friend, who said he never had occasion to change his views, and knew all that was necessary to be known at the age of eighteen, I am not ashamed to confess that I published an article on the Aztecs in the *Freemasons' Magazine*, June, 1855, under the impression that they were types of a distinct race. I have made some advances in the study of Anthropology since that time.

Vogt thinks, with Wagner, that a minute analysis of psychical phenomena in idiots might yield important results as regards intellectual activity in general; and that some idiots might, by careful training, be raised in the intellectual scale.* From known facts intellectual capacity is closely connected with cranial and cerebral structure, and never admitted a well-articulated language. There is no trace in history of such decided human characters as ideas, a higher intelligence and abstraction, not even of such primitive notions of good and evil, nor of original moral qualities, as induce some modern French authorities to claim for man a separate kingdom. In many respects idiots stand below the animal; they are more helpless, are unable to procure food for themselves, and to preserve life without assistance. Their whole

* A very interesting account of such phenomena is given by Miss Martineau. *Letters on Man's Nature and Development*, by Atkinson and Martineau.

appearance is simious: the deficient forehead, protruding, glassy, rolling eyes, projecting muzzle, stooping posture, long arms and short legs, minute analogies in cranial and cerebral structure, restlessness, spasmodic twitches, shrill notes of pleasure or anger—who does not here detect the ape? He concludes his picture of ape man as follows: "There is undoubtedly a mixture of human and simious character, the latter being produced by an arrested development of the fœtus *in utero*, forming thus an intermediate stage between ape and man, produced by the progress of the laws of the development of human genus. If now it be possible that man, by arrest of development, may approximate the ape, the formative law must be the same for both; and so we cannot deny the possibility that just as man may, by arrest of development, sink down to the ape, so may the ape, by a progressive development, approximate to man."

The intelligent student of Vogt will be struck with the remarkable approximation to the human type in the skulls of some American monkeys; *e. g.*, those of the brown sajou (*Cebus apella*), and the capuchin (*Cebus albifrons*). Illustrations are given of the top view, profile, and base of skull (Lecture 8). After these, let him look at drawings of monkey brains (pp. 212, 213), and following Vogt's advice, "compare with these the brains of the Hottentot Venus and the German Gauss. We may leave the inference to common sense." He concludes, "the unprejudiced observer cannot fail to find that the sum of the difference between two species of apes is in no case greater, and in many cases much less, than those obtaining between two races of mankind, and he will arrive at the conclusion, that the races of mankind must either be considered as different species, or the species of apes must be designated races. But what is to become of systematic zoology, if long and short-tailed species of apes, differing so much in external form that they have been divided into genera, are to constitute only varieties or races? All systematic natural history would go to ruin; and all *Simiadæ*, from the lowest ouistiti up to the gorilla, would be fused into one whirlpool, which would swallow up man and all his races" (p. 214). "No man would certainly have doubted the specific difference in mankind, if the unity of the human race had not to be defended at any price,—if a tradition had not to be supported in opposition to the plainest facts,—a tradition which has been the more venerated because it runs counter to positive science. As regards species, then, we hold fast by the principle that the genus *Homo* consists of several species, which deviate from each other as much as, if not more so, than most *Simiadæ*; if the principles of systematic zoology are to be of any value, they must be as applicable to the human as to the simious species" (p. 222).

I conclude by presenting Vogt's ante-monogenistic views of ape-origins of man. "Whilst we assume the actual descent of the human race from apes, and believe the differences between both, which will become greater by further development of man, result from selection and intermixture, we decidedly repudiate an inference we are charged with, that we must necessarily come back to the original unity of mankind, and consider Adam as an intermediate form between ape and man, etc. Never was there a more incorrect inference; as far as I know, no Darwinist has either raised that question, or drawn the above inferences, for the simple reason that it neither accords with the facts, nor their consequences.* *The ape-type does not culminate in one, but in three anthropoid apes*, which belong to at least different genera. Two of these, orang and gorilla, must be divided into different species; there are, perhaps, some varieties of them which form dispersive circles, like some around certain races of man. This much is certain; each of these anthropoid apes has its peculiar characters by which it approaches man: the chimpanzee, by cranial and dental structure; the orang, by its cerebral structure; the gorilla, by structure of the extremities. None of these stands next to man in all points,—the three forms approach man from different sides without reaching him," etc. (p. 464). "Let us imagine the three anthropoid apes continued to the human type,—which they do not reach, and, perhaps, never will reach; we shall then see developed from the three parallel series of apes, three different primary races of mankind, two dolichocephalic races descended from gorilla and chimpanzee, and one brachycephalic, descended from orang: that descended from gorilla is, perhaps, distinguished by development of teeth and chest; that descended from orang, by length of arms and light red hair; and that issued from chimpanzee, by black colour, slender bones, and less massive jaws."

The chimpanzee has a white, or rather a yellow face. M. du Chaillu tells us, the Negroes "have a notion that there is some mysterious connexion or affinity between the chimpanzee and the white man." He thinks it is owing to the pale face of the chimpanzee, which has suggested the notion that we are descended from it, as the Negro has descended from the black-faced gorilla."† Vogt continues: "When, therefore, we look upon apes and their developments as proceeding from different parallel series, the assumption of only one intermediate form between man and ape is unjustifiable, inasmuch as we know in

* The Editor of Vogt's Lectures adds in a note: "This is quite true, although the author is mistaken respecting there being no Darwinist advocates for unity. I have alluded to this in the Preface."—Ed.

† *Journey to Ashango Land*, p. 35.

our present creation three different sources for such intermediate forms. Schröder Van der Kolk and Vrolik agree with us in this respect, although they are opposed to Darwin's theory. 'We know,' say they, 'no species of apes which forms a direct transition to man. If man is to be derived from the ape, we must search for his head amongst the small monkeys which group themselves round the Cebus and Ouistitis; for his hand, we must go to the chimpanzee; for his skeleton, to the siamang; for his brain, to the orang [and, I add, for his foot, to the gorilla]. Putting aside difference in teeth, it is manifest that the general aspect of the skull of a Cebus or a Ouistiti, or some other cognate monkeys, resembles, though in miniature, more the skull of man, than the skull of an adult gorilla, chimpanzee, or orang.'" Vogt adds: "It would thus be requisite to collect the human characters from five different apes; from one of America, from two of Africa, from one of Borneo, and from one of Sumatra; the primitive relations of man are accordingly so scattered, that we can hardly believe in one common stock. It is just this plurality of characters which confirms us in our view. If macaci in the Senegal, baboons in the Gambia, and gibbons in Borneo, could have become developed into anthropoid apes, we cannot see why American apes should not be capable of a similar development. If in different regions of the globe, anthropoid apes may issue from different stocks, we cannot see why these different stocks should be denied further development into the human type, and that only one stock should possess this privilege; in short, we cannot see why American races of men may not be derived from American apes, Negroes from African apes, or Negritos, perhaps, from Asiatic apes!"

After all, why not go still further, and look to another species altogether for man's parentage, in those countries where neither apes nor monkeys are found. The Australian native points to the kangaroo as his "old man." Why not? a very respectable progenitor! Some men appear to be still in the reptilian phase, of three chambered heart, sluggish blood, and their manner of crawling through life.

Vogt arrives at similar results in examining mankind and their history, tracing the plurality of species, not merely in historic, but in pre-historic times. "If this plurality of races be a fact,—if this constancy of character be another proof for the great antiquity of the various types, for their occurrence in diluvium, or even in older strata,—then all these facts do not lead to one common fundamental stock, to one intermediate form between man and ape, but to many parallel series, which, more or less locally confined, might have been developed from various parallel series of apes. If apes became de-

veloped into men, they had, in the Old World, a range from the equator up to England, and could thus form the autochthonic races upon the various spots where we have found the oldest species of mankind. This assumption equally leads to an original plurality of mankind, not to their derivation from a single stock, but from the various twigs of that tree, so rich in branches, which we surround with the Order of primates or apes. The simian type parts in various directions. It first divides into two chief branches,—monkeys of Old, and monkeys of New World; each of these main branches produces twigs, which seem more and more to part from each. But on arriving at perfection, the ends of the twigs turn again towards each other; so that from fundamentally distinct families of gibbons, macaci, and baboons are developed the three anthropoid apes, which, by a number of common characters, stand considerably nearer each other than the groups of which they are the heads."

"Does not the history of man present something similar? The farther back we go in history the greater is the contrast between individual types—the most decided long-heads immediately by the side of the most decided shorthead. Our savage ancestors stand opposed to each other—stock against stock, race against race, species against species. By the constant working of his brain, man gradually emerges from his primitive barbarism; he begins to recognise his relations to other stocks, races, and species, with whom he finally intermixes and interbreeds. Innumerable mongrel races gradually fill up the spaces between originally so distinct types, and, notwithstanding the constancy of characters in spite of the tenacity with which primitive races resist alteration, they are by fusion slowly led towards unity.' (P. 468.)

Lest I be accused of undue partiality towards this able writer, I must concur with the regret expressed by Dr. Hunt in his Preface, that Professor Vogt should have displayed so decided an *animus* against theologians. I regret this for two reasons—first, that this display of animus is in itself unworthy of a man of science; secondly, that it is especially to be avoided, as calculated to make truth unpopular.

J. MacGregor Allan.

MR. BRAY ON THE SCIENCE OF MAN.*

MR. CHARLES BRAY has had the kindness to publish a pamphlet informing the Anthropologists of Europe of the way in which they ought in future to conduct their researches. The pamphlet is amusing if it is not very instructive. Mr. Bray's Preface runs as follows:—

"The object of Anthropological Science must be to improve the race of men, and to make Newtons and Shakespears to order. Our life and soul are part of the forces and powers of nature—of the spirit ocean that surrounds us. They are entirely supplied from the great fountain which works only in accordance with fixed law, and the conditions of their existence we can therefore discover and control. If the world's thanks are universally acknowledged to be due to the late Jonas Webb for improving the breed of short horns, and for teaching us how 'to grow more mutton and wool to the acre,' surely we shall owe more to the man who will teach us how to improve the breed of men, and to grow more 'brains to the acre.' Our Anthropological Societies, both of London and Paris, are occupied too exclusively with the past; with man's antiquity; with his origin, whether born or created; with race distinctions, being most assiduous in collecting skulls, and talking most learnedly of dolichocephalic and brachycephalic heads (long and short heads), without apparently a suspicion at present that brains are of any use. As the President of the London Society truly tells us, the attention of the Society has, during the four years of its existence, been 'mostly directed to the physical characteristics of man;' and he says, 'I am not aware that a single fact of cerebral physiology has been brought under our consideration for investigation.' The object of the present writer is to enter, doubtless, 'the ignorant and egoistical' but humble protest of an outsider against this mode of proceeding; and to point to the spacious and fertile fields that invite attention. Between the aspirations of the young lady who tremblingly asks, 'why the nose is placed on the front of the face, pointing towards the infinite, if it is not to give, as it were, a foresmell of the illimitable,' and the proceedings of the Anthropological Society, there is no doubt a wide range, but either extreme is probably equally useful. As there is so much to do, perhaps it would be better to take man as we now find him, than to begin at the very beginning, where the record may be considered by some a little obscure. Of course, it is fully admitted that all honest investigation, in every field of research, is of importance; it is simply a question of relative importance."

Mr. Bray, we must admit, is a bold man; he is the first writer we know of who has openly proclaimed that the end and aim of the An-

* *The Science of Man: a bird's-eye view of the wide and fertile field of Anthropology.* By Charles Bray, author of *Force, and its Mental Correlates.* Longmans, 1868. Price 1s.

thropological Science must be to improve the breed of mankind. Mr. Bray deserves encouragement. The time may yet be far off when the Science of Anthropology will be ripe to lay down fixed laws for the improvement of the human species. We have yet to have in Europe our Anthropological gardens side by side with those of Zoology and Botany; this is the first step towards founding a real Science of Man. In this way alone can we ever discover the way to make our Newtons and Shakespeares to order.

The first part of Mr. Bray's pamphlet is occupied mostly with what reads like a complaint against modern Anthropologists. Mr. Bray says:—

"Anthropology 'proposes to study man in all his leading aspects, physical, mental, and historical;' and if it really is 'the Science of Man,' it must occupy itself principally with the present laws and conditions of his being. His past history—with which Anthropological Societies have hitherto too exclusively occupied themselves—as to whether he was created or born, or as to his age upon this earth, has really little to do with this science. The history of the past can be of use only so far as it bears upon the present. Except Mrs. Shelley's *Frankenstein*, we know of no man that has yet come into the world without being born; and as to his age, whether six thousand or six hundred thousand years, for practical purposes we cannot go beyond the comparatively modern date of written record. In deference, however, to those who think such matters of importance, we will consent to go half-way with them, and take woman's advent into this world upon authority. A modern sceptical philosopher, Dr. Whately, defines woman as 'a creature incapable of the exercise of reason, and that pokes the fire from the top;' but this is since the fall, for we have it on the recognised authority of Matthew Henry's Commentary, that man was dust refined, but that woman was dust double-refined, one remove further from the earth; and that Adam slept while his wife was in making, that no room might be left to imagine that he had herein "directed the Spirit of the Lord, or been his counsellor."' And also we are told by the same learned Commentator, having reference, doubtless, to the obedience that a woman is known to owe to man, 'that the woman was made of a rib out of the side of Adam; not made out of his head to top him, not out of his feet to be trampled upon by him, but out of his side to be equal with him, under his arm to be protected, and near his heart to be beloved.' Now we are willing to take all this about woman on such excellent authority, so that anything we have to say less orthodox about man may be condoned. A 'Science of Man' ought to teach us how to make a man according to the most approved pattern, and with all the modern improvements. Anthropology, it must be confessed, has advanced little in this direction at present, and has occupied itself too exclusively with scratching among the dry bones of past ages; but it is with living function and not dead form that we have to do."

Mr. Bray says, "there exists a curious difference of opinion amongst

the Members of the London Anthropological Society on the subject of the physiology of the brain." We believe that on this and other subjects there must, of necessity, be great differences of opinion; if men were all of one opinion there would be no necessity for their meeting together to discuss subjects. Mr. Bray seems to be in a dreadful hurry that every one should believe as he does; he seems to be one of the few remaining mongrel philosophers who believe in Spurzheim as their god, and George Combe as his prophet. Mr. Bray may yet become himself an interesting object of study, as being the last of his kind. We are sorry for Mr. Bray; if he could only get phrenological jumble out of his blood he might yet write wisely. Mr. Bray asserts "the bridge between physics and metaphysics has been found." By whom? This we are not told. There is just a glimmer of hope that Mr. Bray may yet be saved from further folly when we read thus: Metaphysics "is based on physics;" we cannot say that such is the fact, but we admit it ought to be. We wish Mr. Bray would let us have a look at the metaphysics which is based purely on physics. Mr. Bray believes that phrenology is such a system; we are sorry for his delusion.

A specimen of Mr. Bray's views will assist to dispel the idea that we have yet discovered the physics of the brain. He says:—

"We might have brains translating the forces from without into mental impressions of an entirely different kind; as it is, no two persons' mental impressions are the same, but vary in clearness, in intensity, and in breadth, according to the size, and quality or temperament, of the organ or part of the brain with which they are connected. Transmuted forces thus passing through one portion of the brain, and acted upon by forces from without, create the world as it appears in our consciousness; passing through other larger portions of the brain, the organs of the propensities and sentiments, they create the world of our likes and antipathies, called the moral world. This world of ideas and feelings, about which we make such an undignified fuss, is purely phenomenal, and passes away with each turn of the great kaleidoscope—with each evolution and correlation of force. Our joys and sorrows, our hopes and fears, our sins and sorrows, our good and evil, are purely subjective, affecting only ourselves; of the One Great Reality, or Entity, or Spirit, or Power, or Force, that underlies *all* phenomena, we can know nothing; our own will-power alone constituting a distant analogy. We know, however, that,

> 'For love, and beauty, and delight
> There is no death nor change.'—*Shelley.*

With respect to races of men and the permanence of physical types, "the Darwinists assume that all animals, including man, are derived from a small number of simple beings, possibly from a primordial monad. The monogenists, with much less boldness, are of opinion that all human races are derived, if not from a single couple, at least from a certain number of primitive men perfectly resembling each

other. The Polygenists finally assert that human types are only liable to slight modifications; that the chief physical characteristics are permanent; and that, consequently, the actual diversity of races can only be attributed to the multiplicity of their origin.'* We greatly incline to the latter hypothesis. Without going with the Darwinists to the very beginning, it seems probable that the causes that were equal to the production of the simple beings could have produced also the more complex, and still more probable that the causes that could have produced a single man could have equally produced all the varieties. We believe, with Professor Macdonald, in 'the separate centres of creation of the different races adapted to the different parts of the world, and that the east and midland mountains had peculiar creations adapted to them.' The Professor shows us how 'a due consideration of the progressive development of an embryo or germ within the Graafian vesicle would militate against Darwinism in any attempt to press hybridism beyond the boundary of nearly allied species, and also against breeding among hybrids, themselves being carried beyond the third or fourth generations, unless refreshed by one or other of the originating species.'†

"Races that had probably the same ancestral types, such as those which now inhabit Europe, are crossed with advantage, but the crossing of distinct races makes mongrels; what the inferior gains the superior loses; and there is always a tendency to revert to the original or ancestral type. It will be easier then to breed from good stock, and thus fill the world on the Malthusian principle, than to improve the inferior races, which, on the principle of natural selection, cannot fail to be 'civilised' off the face of the earth."

We must decline to follow our author into the second part of his pamphlet, entitled "The Occult Powers of Man." We quote the two concluding pages, and are glad to see that our author is not so severe on us at the end of his work as at the beginning. We will only hope that Anthropologists will, ere long, be favoured with the system of metaphysics, "which is based on physics." Mr. Bray thus ends his pamphlet:—

"Force is persistent, and both body and mind are indestructible, except in form; and what new form they may take in the future it is impossible to say; but, if it be such as has been assigned to them by the spiritualists, it is a dark look-out for us indeed. What is the nature or essence of that Agent, or Substance, or Being, or Entity, or Force, underlying all phenomena, but whose mode of action only is known to us, we do not know. By force or power we mean the cause of all things, that which can and does produce all phenomena; but this power is as inseparable from its source, or that to which it belongs, as motion is from the thing that moves. If unity is claimed for the mind, it lies in that which underlies *all* phenomena, and not in its mode of action, alone known to us; and however varied these phe-

* *Anthropological Review*, January, 1868, p. 42.
† *Journal of the Anthropological Society*, pp. 118-122, July, 1868.

nomena, it may be that a few simple laws underneath, attributes of the source of all power, produce all the variety: 'Pleasure and pain being to voluntary motion what attraction and repulsion are to inorganic matter, and the Science of Morality to the analysis of pleasure and pain what the Science of Chemistry is to the different substances that compose this globe.'* This unity of the noumenon, &c., may also account for all that at present seems so mysterious to us in clairvoyance and other normal and abnormal conditions of mind. Whether we have any powers or intuitions which enable us to see 'through phenomena to laws,' and through laws to the Lawgiver, is yet matter for investigation. It would seem as if there were occasional gleams through small chinks which will widen with the ages. We have 'a noumenal integer phenomenally differentiated into the glittering universe of things;' and to pass from one to the other, to be absorbed in universal being, is the great aim of the Buddhist, whose one infallible diagnostic is the belief in the infinite capacity of the human mind. The natural eye, he says, takes account only of appearances; it requires the severest discipline for a man to behold the reality. Prayer, fasting, and solitude constituted this discipline, and certainly as the brain is emptied of its natural force by these means, it is filled with force from without, often inducing a state of trance in which the barrier between individual and general mind seems at least to be partially broken down. But whatever may be the powers of man, and the relation of the concentrated forces which constitutes his individuality, to the natural forces around him, we can scarcely be said yet to have placed their investigation on anything like a scientific basis; and Mr. Le Gros Clark, in a lecture recently delivered to the Council and Members of the Royal College of Surgeons, said that the nature and functions fulfilled by the electric fluid in the sustaining of animal and vegetable life is still as profound a secret as was the law of gravitation before the days of Kepler and Newton. When this is done and the light of science is let into this department, we shall at least be able to do for the onward progress in mind as much as steam has done for mere material civilisation. The power of the ancient magician, the miracles of all religions, the powers of clairvoyance are real, and we have only to bring them under law to make them serviceable,—not, as heretofore, to chicanery and superstition, but to a great advance in mental science. Surely this is the legitimate function of the Anthropological Society. The *Anthropological Review*, April, 1867, says, 'To whatever cause it may be attributed, let us begin with the rather humiliating confession that, anthropology, both in its classification and terminology, is in a miserably confused and almost chaotic condition.' This, I fear, is too true, although the last number of the *Review* and *Journal* (July, 1868) shows a more living interest. Would not the objects of the society be better promoted if 'The Science of Man' were divided into departments, and committees were appointed to *investigate* and report not on what man *was*, and how and when and where he began, but on what he is now, here present, and what he may become under scientific development?"

* *Philosophy of Necessity*, p. 21, second edition.

ON THE WEIGHT OF THE BRAIN IN THE NEGRO.

To the Editor of the Anthropological Review.

Sir,—In the article of the last number of the *Anthropological Review*, entitled "The Negro as a Soldier," said to be a "valuable report by Sandford B. Hunt, M.D.," there is, at p. 51, what is entitled an "Ethnographical Table," which appears really to be a *table of the weight of the brain* in four hundred and five soldiers, who died during the late war in the United States, and whose autopsies were "made under the direction of Surgeon Ira Russell." This table is, perhaps, not so well authenticated as might have been desired, as, from the above statement, it cannot be quite unhesitatingly attributed to Dr. Ira Russell, and, next, no particulars are given with respect to the mode adopted in determining the weight of the brain. We are left in doubt, whether the brains were divested of their membranes and drained of their fluids, and whether the *medulla oblongata* were reckoned a portion of the brain and weighed with it, as is most likely to have been the case.

The determination of the weights of the brains of 405 adult men, in all probability in the vigour of life, by actual metrological observation, was in itself an investigation of very great interest and importance. Hence it is much to be regretted that there should be any doubt whether means were taken to render the observations as definite and exact as possible, and that explanations have not been given, so that the observations might be fully understood and perfectly relied upon.

Of the brains enumerated in this table, 141 are those of "black," that is Negro, men. The average weight of the brain in these 141 Negroes is stated to have been 46·96 ounces avoirdupois. The largest weighed 56 ounces, the least 35·75 ozs., and, in other respects, they stood in these relations:—5 weighed between 55 and 60 ozs.; 42 between 50 and 55 ozs.; 51 between 45 and 50 ozs.; 38 between 40 and 45 ozs.; and 3 between 35 and 40 ozs. It will be seen that this enumeration accounts for only 139 of the brains, not the 141 of the table.

The writer, after giving the above table, next speaks of the same series of autopsies made by Dr. Ira Russell, in which the weight of the brain is given in the same number of cases, viz. 405, adding, "of which 24 were white and 391 black," *i.e.*, reckoning all those to be black who had any degree of Negro blood.

But the point to which I particularly wish to draw the attention of

your readers is the general conclusion, as to the average weight of the Negro's brain. This deserves to be made a little more conspicuous than is done in the table. It is stated to be 46·96 ozs. av., which is as nearly as possible 47 ozs. Probably the most accurate and reliable previous observations on the weight of the brain of the Negro, ascertained by actual weighing, are those of Professor John Reid and of Dr. T. B. Peacock.* The average brain-weight of the Negro men was 44·34 ozs., that of the women 43·50 ozs., the mean of the sexes being 43·92 ozs.; but it is with the men whose average brain-weight was 44·34 ozs. that we have to do, when we compare this with that of the Negro soldier, which was larger, viz., 46·96 oz. In the tables formed by myself† the following results of the brain-weights of *male* Negroes come out. In 12 skulls of "tribes unknown" the average was 44·30 ozs.; in a Joloff, 46·92 ozs.; in a Foulah, 43·42 ozs.; in a Mandingoe, 47·14 ozs.; in a Sergia, 46·92 ozs.; in a Fantee, 41·60 ozs.; in 3 Ashantees, 42·91 ozs.; in 5 Dahomans, 46·63 ozs.; in 2 Bakeles, 50·57 ozs.; and in 2 Congos, 39·76 ozs. These yield an average of 45 ounces. The weight of the brain of the male Guinea Negro examined by Professor L. Calon was only 44·44 ozs.‡ So that Dr. Ira Russell's experiments afford a brain-weight for the male Negro rather heavier, from one to two ounces heavier, than those of other observers. Dr. S. B. Hunt allows that this weight is "over five ounces *less* than that of the white."

He next goes into the speculation whether what we name civilisation, freedom, and education, "the new nationality of America," has the effect of enlarging the brain, to which, as he remarks, general opinion leads. But, if this were so, we must attribute the large brains of the American Negro soldiers to some such influences in their cases, to which it is certain Dr. S. B. Hunt would not consent. The influences to which the Negro of the United States has been exposed are characterised by the *absence* of those which are supposed to enlarge the brain; thus Dr. S. B. Hunt's table proves too much; it proves that Negroes in a state of slavery have heavier brains than those in Africa, at the same time that it contradicts or refutes the above speculation. There is, however, not any good ground to think that the speculation, or the arguments founded upon it, are of any particular value. The weight of the brain, like all the other peculiarities of human races, is a *race character*, appertaining to each race specifically.

* "On the Weight of the Brain of the Negro, *Memoirs of the Anthrop. Soc. of London*, vol. i, p. 65 and 520.

† "Contributions towards determining the weight of the Brain in different Races of Men," *Philosophical Transactions*, 1868, p. 505.

‡ "The Brain of a Negro of Guinea," *Anthrop. Review*, No. xxii, 1868, p. 279.

In Dr. S. B. Hunt's concluding remark this position is hardly sufficiently attended to. He says "they (the American Negroes) have already the same cranial capacity with the Hindostanees, who have developed a high civilisation, a profound philosophy and a rational religion." Here Dr. S. B. Hunt is disposed to underrate the Negro of America, for he has, according to the table, a larger average brain-weight than the natives of Hindostan, whether we allow to the latter "a high civilisation, a profound philosophy, and a rational religion," or not. Dr. S. B. Hunt is, no doubt, comparing the civilisation, philosophy, and religion of the two races, Negroes and Hindostanees. In the tables above referred to the male Hindoos are shown to have a mean brain-weight of 44·22 ozs., and the mean of Dr. S. G. Morton's table was still less, only 41·74 ozs. So that we have a comparatively "high civilisation, a profound philosophy, and a rational religion" developed among a people who are distinguished among human races for the remarkable smallness of their brains.

If you consider these remarks of sufficient importance, please to give them a place in your next number.

I am, your obedient servant,

J. Barnard Davis.

Shelton, Hanley, Staffordshire, March 2, 1869.

MAUDSLEY ON PHYSIOLOGY AND PATHOLOGY OF THE BRAIN.*

It is not very long since mental diseases have been considered as a kind of felony, and the poor patients treated as criminals, put into chains, imprisoned and condemned to corporal punishment, until the great Pinel came forward as an attorney for the poor and unhappy lunatics and pleaded their case in a most simple but very successful manner. His work, *Traité Medico-Philosophique sur l'aliénation mentale* (Paris, 1808), is one of the brightest ornaments in medical literature, and the success gained one of the most noble triumphs in the history of humanity.

We cannot wonder that under circumstances when mental maladies were considered the work of the devil, the treatment consisted in exorcisms, and the most perverted means were used in order to get rid of the evil spirit. Pathological anatomy remained silent, and thus

* *The Physiology and Pathology of the Mind.* By Henry Maudsley, M.D. Lond., Physician to the West London Hospital, etc., etc. London: Macmillan & Co.

it was possible that a genius like John Hunter could maintain that mental diseases leave no trace of their former existence impressed into the brain after the death of the patients. It was to show the fallacy of this conclusion that Dr. A. Marshall anatomised a great number of brains in the old Bethlehem Hospital, but his work, *The Morbid Anatomy of the Brain in Mania and Hydrophobia* was only published in 1815.

It is true that English literature is possessed of valuable works on mental diseases, written in the seventeenth and eighteenth centuries, and Burton, whose classical work, *Anatomy of Melancholy*, was published in 1627, has deservedly been called "the Shakespere amongst Psychologists." Yet it is only after Pinel's great reformatory efforts that English medical literature has contributed both in an extensive and excellent manner towards the humane edifice of which Pinel has laid the foundation stone.

Before the eighteenth century there were only two asylums in all England, viz., Bedlam and St. Luke's. The inmates of which, who were supposed to be influenced by the moon, were fettered at each change and flogged in order to prevent the irritation expected to be caused by that luminary, an unfortunate error to which Dr. Mead's work, *Medica Sacra*, 1749, has contributed not little.

The first asylum in which the new principle of Pinel bore sway was that erected by William Tuke, near York. Tuke, sixty-four years old in 1796, undertook the duties of superintendent to the hospital, to which he remained attached until his death in 1822. Although his humane principles became general only a long time afterwards, yet the literature of that branch of medical science took another turn, and the management of many asylums imitated the lucid example of William Tuke.

In our present day we find the most renowned names of English authors amongst the writers on the subject, such names as George Burrows, Prichard, W. C. Ellis, J. Williams, Thurnam, Monro, Winslow, and others.

The work of Dr. Maudsley, treating of the physiology and pathology of the mind, has been received with great applause and encomium by the medical profession, as well as by philosophers. The study of the human mind in our present days forms no longer part of abstract philosophy. To have a claim of any value, it must be based on observation, both in the living subject, healthy as well as diseased, and on extensive and minute pathological researches into the condition of the brain. This basis Dr. Maudsley takes as his ground to stand upon, whence he shows the direction in which the study of mind is to be pursued, and lays down the laws on which the healthy brain acts.

It is on this same ground that he shows the connection of mind and the nervous system, and on which emotion, volition, memory, imagination, and all the properties attributed to the mind are discussed. And all this is treated in a most genial philosophical manner, and written in a language clear and eloquent at once. When touching on former errors, the author hints to still existing prejudices, particularly influencing the study of mind which some would still like to look upon as belonging to the province of metaphysics.

"Can we wonder, then, that the erroneous method (metaphysical) was triumphant in Greece in the fourth century before Christ, when it is only recently in England, in the nineteenth century after Christ, that the barbarian's reverence for the dead body has permitted an anatomical dissection, and when the finger-bone of a saint, or a rag of his clothing, is still treasured up, in some parts of the world, as a most precious relic, endowed with miraculous virtues! The evil of the metaphysical method was not intellectual deficiency only, but a corresponding baneful moral error."

When mind was considered by philosophers who, perhaps, had never seen a brain in their lives, they generally started from the phenomena observed in adults, and took no notice of the first dawning of the soul in infants. Animals were entirely excluded from their consideration, as not possessing mind at all. Our present position, when the mental phenomena are studied by physiologists, is totally different. We know mind only in connection with the body, and are aware that the mental conditions change with alterations of the frame—*mens sana in corpore sano*—and, therefore, the condition of the body cannot be excluded from the study of the condition of what is called soul, mind, etc. But the most important part of investigation is the comparative pathology beginning where the first mental movement becomes perceptible and going through all stages of development, up to the adult human being. "Where," says Dr. Maudsley, "has the animal any place in the accepted system of psychology? Or the child, the direction of whose early mental development is commonly decisive of its future destiny?" To speak of an induction, where so many important instances are neglected, and others are selected, according to caprice or the ease of convenience, is to rob the word of all definite meaning and most mischievously to misuse it. A psychology which is truly inductive must follow the order of nature, and begin where mind begins in the animal and infant, gradually rising thence to those higher and more complex mental phenomena, which the introspective philosopher discerns, or thinks he discerns. Certainly, it may be said, and it has been said, that inferences as to the mental phenomena of the child can be correctly formed from the phenomena of the adult mind. But

it is exactly because such erroneous inferences have been made that the mental phenomena of the child have been misunderstood and misinterpreted, and that psychology has not received the benefit of the correction which a faithful observation of them would have furnished. It was the physiologist who, by a careful observation of the lower animals, "having entered firmly on the true road, and submitting his understanding to things," arrived at generalisations which were found to explain many of the mental phenomena of the child, and which have furthermore thrown so much light upon the mental life of the adult. The careful study of the genesis of mind is as necessary to a true knowledge of mental phenomena as the study of its plan of development confessedly is to an adequate conception of the bodily life."

These few passages may suffice to indicate the direction in which Dr. Maudsley's method tends, whose excellent work, which has already become standard, we most urgently recommend to the careful study of all those who are interested in the physiology and pathology of the brain.

RESUMÉ OF THE "BULLETINS" OF THE PARIS ANTHROPOLOGICAL SOCIETY.

(*From June* 1867, *to January* 1868.)

By E. VILLIN, F.A.S.L., F.R.S.L.

THE Paris Society has published its labours, during the half-year ending December, 1868, in two numbers of "Bulletins," which we had promised to review ever since their publication; but the multiplicity of matters which this *Review* has had to deal with, has, until the present time, prevented us from fulfilling this pleasurable duty.

Anthropological labours in Paris are quite as interesting to us as the labours performed by the English Society. It is, however, impossible to give our readers a complete report, and we may be excused for only giving short abstracts of researches and papers, to which a complete translation alone could do justice, so replete with facts and matter are they. We therefore advise those students of anthropology, who desire to see the progress that this science has been making everywhere, to read the French "Bulletins" themselves, and we promise them to be amply repaid for the trouble; for, as Horace has it, "*Est operæ pretium.*"

In a short but learned paper, called "Phases Sociales," M. Letourneau, after a survey of the different races of man inhabiting the globe, comes to a conclusion with which we entirely agree; namely, that "individually and collectively man passes through a series of phases

succeeding and producing one another; that at first—a being purely and simply *nutritive*—he becomes specially *sensitive*, then *moral*, and lastly *intellectual*. . . . The man in whom nutritive wants predominate, is at the bottom of the scale; and the man who has moral and, above all, intellectual wants, stands at the summit of civilisation; whilst the man whose wants are *sensitive*, stands in the middle of the social scale. But, adds M. Letourneau, humanity has not anywhere, as yet, attained the *intellectual* point. The man in whom all these aptitudes, all these wants would be coexisting—with no other differences than those of energy—would be, would constitute complete man."

M. Lagneau, in a learned paper on the "Anthropology of France," carefully reviews the types of nearly every province of the French empire. For this the author has consulted the best writers, and has availed himself of the observations made everywhere by the "Conseils de Révision" on the yearly military recruiting; he also made many observations himself, and this contribution to the science of man seems altogether reliable. But it is too full of particular details for us to attempt to give an analysis of it; we must therefore refer our readers to the original itself. One fact, however, we must not pass unnoticed: M. Lagneau insists upon the importance of studying the idioms and *patois* of various departments, some of which, as M. de Ranse has proved, directly descend from the original settlers.*

Dr. Destruges, of Guayaquil, on sending to the Paris Society a human head beautifully mummified, still ornamented with its flowing black hair, but reduced by an artificial process, after death, to the size of a small ape's head, also sent some information as regards the means employed by the Indians to obtain this curious result. As this subject has not yet been treated scientifically by English anthropologists, we shall give M. Destruges' letter in full:—

"The process through which the *Jibaros* reduce in size, and preserve for a very long time, the heads of their enemies killed in war, is no longer a mystery. They roll the leaves of a plant (to us unknown) into a ball, and this ball is heated to an elevated temperature by a gentle fire, until the external surface presents an almost incandescent aspect. This incandescent ball is then introduced into the soft parts of the head, by that time already separated from the bones of the skull. The soft parts immediately shrink, and receive from the burnt leaves antiseptic and preserving principles. It is these soft

* The Reviewer knows of a village in the Marne department, called *Courtisols*, where the *patois* is absolutely unintelligible to all the surrounding villages; and there is a tradition in the place which, wrongly or rightly, makes the *Courtisiens* a small colony of Huns, who remained there after Attila had been defeated a few miles off.

parts, dried and reduced in size, which the Indians call *chauca*. Upon festival occasions, they carry these *chauchas* dangling from the ends of their lances, and they relate the history and the exploits of the victim whose head now hangs from their weapons."

Are there no botanists who could tell us the name of the plant unknown to M. Destruges? and are there no anthropologists who could use the same means for preserving dead remains? We are fully aware that these mummies are deprived of those characteristics in feature and measurements which alone have any value in the eyes of students; but, at the same time, there are occasions when travellers can have no better means (the plant being known) of bringing specimens home; and when their object is merely to preserve tendons, muscles, or fibres, in their right position in nature, a reduced specimen may be well worth preserving. A traveller cannot possibly bring home, from Central America or Central Africa, a single bulky specimen in spirit of wine; whereas he could, with facility, pack many dry and reduced specimens that, in this shape, would be eagerly studied by the students at home. At a time when the subject of the Jívaro Indian head was comparatively new in England, a paper was published, in 1862, by Don Ramon de Silva-Ferro. This, however, does not give us the method of preservation, which Dr. Destruges has above described.

M. Bouvier has a short paper on "Comparative Craniology of Man and Animals," which led him to the same conclusion as that arrived at by Gratiolet,—"that, whilst admitting that the nervous apparatus, which pervade the cortical substance, have a limited and localised repartition; admitting, also, that special aptitudes can result from them in diverse individuals, I believe that every part of the cerebral envelope equally participates in the power of thought."

M. Kopernicki, of Bucharest, has sent the description of a new Craniograph. This instrument, if well used, gives the measurements of contours with a mathematical accuracy; but it requires experience and time on the part of the craniologist. In spite of this drawback, its results are such that we wonder that the London Society should have delayed the acquisition of this beautiful instrument so long. Perfect accuracy, we must always bear in mind, can alone insure anthropology success.

"Polyzoism" is the title of a most interesting paper by M. Durand (de Gros). If the author of the contribution can establish his theory, it will undoubtedly be a revolution in science of immense importance: for it would reverse what has been considered almost a dogma for a long period. The conclusions of M. Durand, after enumerating his facts, are these:—

"Physiology, medicine, psychology, and morals have agreed, until the present day, in regarding man as a *unity*,—a unity, living, feeling, and thinking, entirely compact and irreducible, as an animated and *simple* body; and, upon this first and common belief, all their dogmatical and practical institutions were framed. However, new facts seem now to demonstrate that this belief is an error; that the human being is, in reality, a collection of organisms, a collection of lives and distinct "ego's", and that its apparent unity lies wholly in the harmony of a hierarchical *ensemble*, the elements of which, connected by a narrow coordination and subordination, yet carry, each in itself, all the essential attributes, all the primitive characters of the individual animal. Such a system is, doubtless, alarming for a vast system of established ideas and things; but let us follow it in its consequences, and we shall be convinced that, if it *destroys*, it also *builds*, and that its work, full of positive truths, is a thousand times preferable to the scaffolding of illusions to which this work will be substituted."

These views created quite a sensation in the Paris Society; and M. Dally, one of its most brilliant members, acknowledged that M. Durand's views upon the multiplicity of centres of vital action really deserved the most serious meditations. "Without being able," said he, "to form as yet an opinion upon their accuracy, I seize this opportunity for supporting his critique, as regards the *abyss* which, according to some naturalists, separates the invertebrates from the vertebrates. The idea that these two branches are constructed on a different plan, whilst evidently the functions are the same, the organic elements are identical, is based upon the sole difference that the apparatus are more or less perfect. Nervous system, circulation, digestion, locomotion, in the two branches, have everything in common; and we can establish the most rigorous analogies between the apparatus, even if we had not the *Amphioxus* and its fossil congeners. I then ask where the abyss is, since we have a ganglionic chain, and the cephalic ganglions of the annulosa, the vertebral channel of the crustaceans, and the pulmonary respiration of the arachnids, etc., etc., to bring against the organic systems of the vertebrates? It would be high time to renounce these pretended abysses, when everything can show or prove, even in the entire modern fauna, incomplete as it is, a more or less, but an undeniable series."

A very animated discussion, full of interest, was caused by a paper upon "The Proportions of the Body according to Races," by Dr. Weisbach. This discussion was carried on by the best Paris Anthropologists to great lengths, and we advise our London students to read it with care. The observations of Dr. Weisbach bear upon ten races,

and he has come to certain conclusions, which were not unanimously accepted, after comparing these races with the Europeans. "The greatest propinquity with the conformation of the anthropomorphic apes indicating the most inferior degree of the human race, we must conclude that the race which possesses the largest amount of simian proportions upon the greatest number of parts of the body, must be the most inferior. Yet we feel embarrassed to give an answer, because in the small number of points upon which we can make a comparison between man and the orang, *the simian resemblance is in no wise exclusively concentrated in* ONE *race; but it divides itself, as to the different parts, amongst the different races, and this so effectually that there remains to each a lesser or greater share of this parental inheritance. Even we, Europeans, cannot pretend to have entirely severed ourselves from this parentage;* witness the shortness of our hand relatively to our arm, and amongst the Slavons and Roumans, the great length of the fore-arm relatively to the arm?

"On examining the different races enumerated from this point, we see that none is completely deprived of dimensions of certain parts which reapproach it nearer to the type of the orang more than the others. The Javanese and Madurians are favoured, because they approach it by the smallest number of points. . . . Whereas the Australian presents the most numerous simian similarities,—in the length of the feet, the smallness of the legs, the broad nose and mouth, the elongated arm, the broad feet, and the thin calves."

MM. Pruner-Bey, Alix, Rochet, Broca, Gavarret, Giraldés, Dally, Pouchet, Bertillon, and de Bligroières, we repeat, discussed this subject in a very scientific and almost exhaustive manner; and, in our opinion, the discussion by far surpasses the paper which caused it in importance. It is given *in extenso* in the "Paris Bulletins," and we regret not to be able now to translate it for the benefit of all our readers.

M. Broca has a Paper on the *Relative Proportions of the Superior and Inferior Limbs amongst the Negroes and the Europeans*, which, like every contribution from that *savant*, is quite an Anthropological treat, for it is full of measurements and facts masterly classified. We consider this paper as an excellent sequel to Dr. Weisbach's, above mentioned. The results arrived at by M. Broca are summed up thus:—

"1. The length of the superior limb, compared to that of the inferior, is less in the negro than in the European. In this the Negro is further from the simian type than the European.

"2. The length of the humerus compared with that of the femur, or with that of the inferior limb, is also less in the Negro, who, in this again, is more removed from the simian type than the European.

"3. The length of the humerus, compared to that of the radius, is much less in the black than in the white. This character brings the Negro nearer to the ape.

"4. The excess of length of the radius in the Negro, compared to the humerus, partly depends upon the shortness of the humerus, but not exclusively. The radius of the Negro is, in fact, longer than that of the white man, when it is compared with the inferior limb.

"5. The superior limb of the Negro, therefore, presents two opposite characters: for whilst, on the one hand, by the length of the radius, the Negro is nearer than the European to the simian type; he, on the other hand, is removed from it by the shortness of the humerus."

These intercrossings are not rare in the different races; they constitute facts little favourable to the idea that all the types of humanity are derived from one type, and they appear to M. Broca to give their testimony in favour of the opinion of the polygenists.

Other subjects, such as Languages, the Age of Stone, Miocene Man, Man during Geological times, and a great variety of skulls and bones, form a series of papers which we strongly recommend to the attention of the student of Anthropology; but we, unfortunately, cannot, for want of space, give any abstract of them. There is, however, a series of contributions on "Civilisation," and "Religions as bearing on Civilisation," which we had promised ourselves to succinctly analyse, so masterly were these subjects treated by MM. Letourneau, Condereau, Pellarin, and Bataillard, from different points of view; but we must forego this duty until the next number of this *Review*. We might say that these questions hardly belong to Anthropology, and this view was at first taken by the Paris Society; but, upon reconsideration, they resolved to give full scope to them, and with a tolerance which we commend to the example of the London Society, five or six learned treatises were read, discussed, and published, mostly upon religion. "A human produce," says M. Bataillard, "which has contributed to civilisation, has had all sorts of influences, and which the man of science, unless he be afraid of fanatics in all countries, cannot ignore, pass by, and treat as if it did not exist. We should therefore study it under all its aspects, as we study politics, art, or literature, since, like these, it contributed—although sometimes in a deplorable manner—to the development of mankind."

We really do not see why the English Society, living as it does in the midst of a tolerant people, Protestants, should be less tolerant than its Paris sister Society. We are convinced that, provided the discussion should be conducted with the same amenity of language as distinguishes our neighbours, no single Fellow of the Anthropological Society of London would at any time object to such important matters being brought under his notice.

ON THE LOCALISATION OF THE FUNCTIONS OF THE BRAIN, WITH SPECIAL REFERENCE TO THE FACULTY OF LANGUAGE.

By James Hunt, Ph.D., F.S.A., F.A.S.L.

(Historical part continued from p. 116, No. 24.)

In the preceding articles it has been abundantly shown that the fundamental principle that the brain is an aggregate of different parts, each subservient to the manifestation of some intellectual phenomena; and that the dispositions of men may be ascertained from the external form of the head, had been promulgated for many centuries before the time of Gall.* It was, however, reserved for Gall to infuse new vigour into the old doctrine of localisation, and to devise a system which was further elaborated by his disciples, and which constitutes now what I have elsewhere called the "bastard science of phrenology."† It would, however, be most unjust to make Gall responsible for all the sentimental cant and arrogance of those who have called themselves his disciples. Strange as it may appear, few such men as Gall have had a smaller number of disciples than this celebrated German physiologist and physiognomist. Gall appeared at a time when the whole of Europe was in a state of excitement, and his teaching was looked upon as tending to promote revolutionary ideas, materialism, and all the rest of the popular bogies in vogue even in scientific circles to the present day.

It is not now my intention to write the life of this remarkable man. Gall was, however, neither a prophet nor a very original thinker; but he was a close and patient observer of nature. He was, indeed, more than this: he was one of those rare instances in humanity who combined in his own person the careful observer with the acute and logical reasoner. Gall has had few, if any, followers worthy of him; the disciples have all been vastly inferior to their master.

We have said that Gall revived the old doctrine of localisation, and that this theory is now, or was until lately, known under the name of "Phrenology, or the doctrine of the mind." Alas! how poor Gall would have repented being the founder of such a jumble as modern phrenology! How his good sense would have revolted from having

* Franz Joseph Gall was born at Tiefenbrunn, 19th of March, 1758, died at Paris 1828.

† "A mixture of Physics and Metaphysics," see address to Dundee Anthropological Conference, *Anthropological Review*, No. 20, Jan. 1868, p. 77.

his observations on the "functions of the brain," called "phrenology or the doctrine of the mind!"

Gall has been in this respect nearly as unfortunate as Blumenbach, who, we are told by a recent writer,* was the "founder of ethnology." It is hardly necessary to observe that Blumenbach never invented or once used the word "ethnology"; although it is not so generally known that Gall never coined or used the word "phrenology." It is not a little remarkable that the fame of both these great men should have to suffer for the indiscretion of their so-called disciples. Blumenbach founded a special branch of science which he named over and over again "Anthropology." Gall in like manner elaborated the observations of his predecessors on the functions of the brain, or, in classical language, the science of encephalonomy, and called it "a system of physiognomy." When Gall first published his lectures some of his followers called his system "the science of craniology." Against this and all such names Gall protested, and said that such names misrepresented his labours, and that he was concerned in the first place with the functions of the brain, and in the second with the physiognomy of the skull.

We must, therefore, do the same justice to Gall as to Blumenbach, and never either call the one a phrenologist or the other an ethnologist. Gall cared no more about the nature of the mind than Blumenbach did about the composition of nations. Both the aggregate of phenomena called mind and the perhaps heterogeneous concourse of atoms constituting nations lie outside the domain of the science which they respectively founded.

It signifies little for science who it was that was so ill-judged as to describe observations on the functions of the brain as the doctrine of the mind, but the following facts are worth mentioning. The originator of the word "phrenology" was Dr. Forster. It gives no small insight into the character of one of Gall's so-called disciples—Dr. Spurzheim—that he claimed to have originated this word himself. Notwithstanding all these attempts to mislead the public as to the real nature of Gall's observations and theory, there now seems to be no doubt that the odium which Gall has incurred from having his name mixed up with phrenology will be as effectively removed as the name of Blumenbach has been vindicated from being the founder of ethnology. A stray writer here and there may yet try to sully the reputation of Gall by identifying his name with a mongrel science he never founded: but it is evident that the time has now come when scientific men are prepared to render equal justice to the founder of the science of mankind, or anthropology, and the founder of the science of the functions of the brain, or encephalonomy.

* Vide Professor Huxley, *Fortnightly Review*, No. 3, p. 263.

Gall's system consists essentially of two distinct propositions: first, in the assumption of a number of distinct cerebral organs for the different mental phenomena—organology; secondly, in the determination of the respective cerebral organs by the inspection and palpation of the cranium, which may be termed cephalonomy, or organoscopy.

A single glance at these propositions shows that they are in some respect independent of each other; for organology, *i.e.* the assumption of a plurality of cerebral organs, for different functions, may be true, and may form an important and reliable basis for the great science of encephalonomy, whilst cephalonomy, *i.e.* their determination by the external form of the cranium, may be false. On the other hand, cephalonomy in the above sense can have no existence as a science unless organology be true.

I wish it to be well understood that I am not dealing now with the whole of Dr. Gall's observations and theories; much less do I purpose now to attack or defend in detail the modern exponents of his system. Gall, like all other real scientific physiologists, was a student of the functions of organic structure. That he was not free from what is the great weakness of scientific men of the present day, viz., the enunciation of speculative opinions, must be admitted; but the real bent of Gall's observations was far more sound and scientific than is the conduct of many who now attack his doctrines. We are not now called on to accept Gall's theories; but in duty bound we have to verify his observations. The present systems of phrenology, with all their assumptions and erroneous inferences, I do not hesitate to assert my belief will soon become a thing of the past. It is only by their complete destruction that we can ever hope to establish a reliable science of encephalonomy and cephalonomy, based on correct and lasting scientific principles.

All true science must, from its nature, be progressive: and this the modern elaborated system of "the doctrine of the mind" can never be. Let us all acknowledge most humbly that we know nothing of the "mind" apart from organisation. All our knowledge as scientific observers can alone be obtained by examining structure in action. Where structure is at rest there are no mental phenomena. Different organic forms when associated with different structures necessarily give rise to different phenomena. This is a law of all organic life, and is as applicable to the human brain as to any other organic structure.

Dr. Gall gave his first lectures on "Schädellehre" in Vienna, in the year 1796. The simple and tangible manner in which he appeared to lay open the secret workshop of human mental phenomena to profane inspection caused great excitement among the ignorant public and

great consternation among the theologians, mystic philosophers, and court impostors of the time. This coalition of rabblecraft, priestcraft, philosophycraft, and courtcraft proved too strong for Dr. Gall. His lectures were forbidden, and he sought an asylum in Paris, where henceforth he fixed his residence, and where he died in 1828, and was buried in the cemetery of Père la Chaise. Gall's head is now in the Natural History Museum of Paris.*

At Rome the Pope paid the same compliment to Gall as he did to Copernicus. In Germany Kotzebue played the same part as Aristophanes of old, and made Gall the laughing-stock of the people. The philosophers vented their rage at their occupation being taken away from them by a mere student of the functions of the brain. Schaller said that the theory was "so indefinite and presumptuous as not to be embarrassed by any facts it meets with." Jessen also thundered against organology, and joined with Volkmann, the physiologist, in misrepresenting the real character of Gall's theory. They charged Gall with only estimating the quantity and not the quality of the brain. This misrepresentation has been continually reiterated down to the present day. Gall, however, found zealous supporters in Reil and Loder in Germany, and Vimont and Broussais in France. Professor Bischoff, in his *Exposition of Gall's System* (Berlin, 1809), says:—

"You must see and hear the man yourself to find out how free he is from all charlatanry and transcendental enthusiasm. Endowed in a rare degree with acuteness and a talent for induction, grown up in nature and in constant intercourse with her, he grasps all the phenomena in the province of organic beings, compares those, which had hitherto been overlooked or superficially observed with the greatest ingenuity, draws his conclusions, and lays down principles which are the more valuable because they are purely empirical, and merely repeated after nature."

Hufeland wrote a similar estimate of him in nearly identical terms.

In England Dr. Gall has had few thorough-going disciples; but of these I may specially mention the late Drs. Engledue and Elliotson, and Mr. H. Atkinson, the authors of *Man's Nature and Development.* The great mass of the phrenologists of the present day are followers of Spurzheim and Combe. As an anatomist, justice has been done to Gall by Mr. Green, Mr. South, and Mr. Solly. On this point his merits

* According to Dr. Fossati, an intimate friend of Gall, the cranioscopic examination of Gall gave the following diagnosis: locality, sense of persons, language, number, order, tune, colour, constructiveness, were all feebly developed; whilst comparison, causality, individuality, eventuality, and firmness were uncommonly large.

are unquestionable and I need only quote the emphatic words of the last-mentioned distinguished anatomist,* who says:—

"Every honest and erudite anatomist must acknowledge that we are indebted mainly to Gall and Spurzheim for the improvements which have been made in our mode of studying the brain."

Mr. Solly observes, respecting the physiological pathological aspects of this question, that the brain†—

"Is made up of many instruments, each having its individual function to perform. The symptoms of the disease will, therefore, vary according to the portion which is diseased. It is true that all the ganglia within the skull are so closely united that any single ganglion can scarcely be affected without the rest sympathising. Still inflammation is sometimes restricted and the symptoms peculiar."

The history of the origin, rise, and decay of phrenology is a subject of not only great interest, but one from which many practical lessons may be learnt. Looking at the question as a whole, I cannot but think that it has deserved its present fate. Much has been said against practical organoscopy, and no doubt a great part of this censure has been well deserved. I know of one remnant of the old Scotch Metaphysical Phrenological School, who has devoted the last forty years of his life to the subject of organology; and although possessing a skull of considerable circumference, has yet, during the whole of this period, never done anything either to advance our knowledge of the "innate faculties of the human mind," or to correct any of the aberrations of his predecessors. This is, I believe, not a solitary instance, but one of many of a like character, tending to illustrate the stagnant character of the "doctrine of the mind." Let us hope that the question of the functions of the brain, in relation to mental phenomena, is now finally emerging both from the theological and metaphysical stages through which it has necessarily had to pass.

I am painfully conscious of the large amount of ignorance and prejudice which exists respecting Gall's theory, partly on account of the odium brought upon it by some of its English disciples.

Much of the prejudice is, however, due to another cause. Gall's theory, if true, unmasks all impostors. No man appears to a disciple of Gall other than he is; and this is utterly repulsive to some men of high scientific and social position.

Having stated this much on the general question of the localisation of the functions of the brain, I shall confine myself, for the present, to the history of the localisation of the faculty of language and speech. The determination of the organ of language by the conforma-

* *The Human Brain*, by Samuel Solly, F.R.S., second edition, 1847, p. x.
† *Loc. cit.*, p. 396.

tion of the eye concerns us here only so far as it was the starting-point from which Gall proceeded. It was the *external* aspect of the eye, its prominence in certain of his schoolfellows, which struck the boy Gall; and it was only at a later period, when reasoning on this fact, and tracing the external sign to an internal cause—the expansion of a certain portion of the brain—that Gall felt induced to place the organ of speech in the anterior lobes.

In all the biographies of Gall, we are told that already when a boy at school he was a keen observer of the differences of talents among his schoolfellows; how he observed that his "ox-eyed" companion, as he called him, invariably beat him in learning lessons by heart; and how, whilst studying medicine at the University of Vienna, he found among the students, professors, and other literary characters of great linguistic attainments, his early impression fully confirmed—namely, that prominent eyes indicate a talent for languages; and how, proceeding step by step, he fancied that he found external marks for each separate talent or propensity, and that he could discern the intellectual and moral character of an individual by his cranial formation.*

As what Gall actually said on the faculty of language and verbal memory has frequently been misrepresented, I shall quote his own words. It will thus be seen that he makes a difference between verbal memory and the faculty of language; but he connects their cerebral organs, and places them both in the frontal convolution, without, however, pointing out their respective limits:—

"I consider as the organ of the memory of words that part of the brain which rests upon the posterior half of the supra-orbital plate. We have not in the engravings indicated by figures the portion in question, as we look upon the sense of words to be only a fragment of the sense of language, of speech."†

Sense of Language; Talent of Philology.—"When the greatest portion of the middle part of the inferior anterior convolutions placed upon the orbital plate is much developed, this wall is not merely flattened, but even depressed; hence results a peculiar position of the eyes. In such a case the eyes are both prominent and depressed towards the cheeks, so that there is a certain interval between the bulb

* See Huarte, in the preceding article.

† *Sens des mots, sens des noms, mémoire des mots, mémoire verbale.*

"Je regarde comme l'organe de la mémoire des mots, cette partie cérébrale qui repose sur la moitié postérieure de la voute de l'orbite. Nous n'avons pas donné dans les gravures des chiffres particuliers à la partie dont il est question, parceque nous avions considéré le sens des mots comme n'étant qu'un fragment du sens du langage de parole."—*Sur les Fonctions du Cerveau, &c.* Par F. J. Gall. Paris: 1825. Tom. v, p. 18.

and the superior arch. The bulb, thus depressed, acts upon the lower arch and increases the curvature. This strong curve produces in the living subject, when the eyelids are open, the appearance of a little sack or pocket filled with water; hence the name 'pocket eyes.'

"Persons who have eyes so formed possess not merely an excellent verbal memory, but they have a peculiar disposition for the study of languages, criticism, in general for everything relating to literature. They write dictionaries, history; they are much adapted to exercise the functions of librarians and conservators; they collect the treasures of all centuries; they compile learned volumes; they fathom antiquity; and if at the same time they are endowed with some other faculties, they gain the admiration of the world for their great erudition."*

Gall does not seem quite clear about persons with prominent eyes having always a good memory. This much, however, he says is certain, that some persons who learn easily by heart may have a bad memory for names; whilst others easily learn names, but cannot recite prose or verses.

Gall also rejects the assumption that thought is impossible without speech. The organs of our faculties, he observes, are alone anterior to the acquisition of speech, and manifest themselves by gestures, sounds, or by both.

If it were true that without signs we could not think, and that only articulate words lead us to abstract ideas, children could not think before they have learned to speak. But experience shows that children have acquired an infinity of notions before speaking.

* *Sens du langage de parole; talent de la philologie*, p. 30.

"Lorsque la plus grande partie de la portion moyenne des circonvolutions inférieures-antérieures placées sur le plancher supérieur de l'orbite ou sur la voute, est très développée, cette partie est non seulement applatie, mais même deprimée. Il en résulte une position particulière des yeux. Dans ce cas, les yeux sont à-la-fois à fleur de tête et deprimés vers les joues, de façon qu'il se trouve un certain intervalle entre le bulbe et l'arcade supérieure. Le bulbe ainsi deprimé agit sur l'arcade inférieure et augment l'échancrure. Cette forte échancrure produit chez le sujet vivant, lorsqu'il a les paupières ouvertes, l'apparence d'une petite poche remplie d'eau, de là le nom d'yeux pochetés.

"Les personnes qui ont les yeux ainsi conformés possèdent non-seulement une mémoire de mots excellente, mais elles se sentent une disposition particulière pour l'étude des langues, pour la critique, en général pour tout ce qui a rapport à la litterature. Elles rédigent des dictionnaires, écrivent l'histoire, elles sont très propres aux fonctions de bibliothécaire et de conservateur; elles rassemblent les richesses éparses de tous les siècles; elles compilent de savans volumes; elles approfondissent les antiquités, et pourvu qu'elles aient d'autres facultés encore, elles font l'admiration de tout le monde par leur vaste érudition."

Gall's theory as regards the localisation of the faculty of language in the anterior lobes was not long in finding a skilful advocate.

On the 21st of February, 1825, Dr. Bouillaud read before the *Academie Royale de Médecine* a memoir, entitled *Recherches cliniques propres à demontrer que la perte de la Parole correspond à la lesion des Lobules Antérieurs du Cerveau, et à confirmer l'opinion de M. Gall sur le siège de l'Organe du Langage articulé.** (Clinical researches demonstrating that the loss of speech corresponds with the lesion of the anterior lobes, and confirming the opinion of Gall as regards the seat of articulate speech.)

As this treatise was not only the first written on this subject, but contains the gist of the whole matter, I shall quote from it at some length.

"I don't know how it is," says Dr. Bouillaud, "that it has hitherto not been taught in the schools that the movements of the speech-organs required in the brain a special centre—a truth which appears to me so simple and natural. In order to demonstrate this, we can show by observation that the tongue and its allied organs may be paralysed isolately, and that they may preserve their movements, whilst other parts—the limbs, for instance—are deprived of their motions. This I shall prove first, and then I shall determine the seat of the nervous centre which governs the mechanism of the organs of speech."

Dr. Bouillaud then gives three cases in which there was loss of articulate speech with preservation of the intelligence, as the patients understood everything, and could express their ideas by gestures and writing. In two of these cases the autopsy showed that the anterior lobe of the brain was in one instance reduced to a purulent mass, and in the other the anterior lobe was softened. The third patient recovered.

"It is not sufficient," says this distinguished Pathologist, "to know that there exists in the brain a particular *force* destined to *co-ordinate* the marvellous movements by which man expresses his feelings and communicates his ideas,—it is important to know the seat of this force in the brain. Now, from my own observations, and from those I have collected from other authors, I am of opinion that the nervous principle in question, which may be called the legislating organ of speech (*organe législateur de la parole*), resides in the anterior lobes of the brain."

After illustrating his position by numerous cases, Dr. Bouillaud arrived at the following conclusions:—

1. In man the brain plays an essential rôle in the mechanism of a great number of movements: it governs all that are subject to the dominion of the intelligence and the will.

2. There exist in the brain special organs, each of which has under its dependence special muscular movements.

* This memoir was also published in vol. viii of the *Archives Générales de Médecine*, 1825, from which we quote.

3. The movements of the speech-organs particularly are governed by a special, distinct, and independent cerebral centre.

4. This cerebral centre occupies the anterior lobes.

5. The loss of speech depends sometimes on the loss of verbal memory; sometimes on that of the muscular movements requisite for speech, or what amounts to the same thing; sometimes on the lesion of the grey matter; and sometimes on the lesion of the white substance of the anterior lobes.

6. The loss of speech does not involve the loss of movements of the tongue, considered as an organ of prehension, mastication, and deglutition, nor the loss of taste, which presupposes that the tongue has in the nervous centre three distinct sources of action—an hypothesis, or rather a truth, which admirably accords with the presence of a triple nervous organ in the tissue of the tongue.

7. Several nerves have their origin in the brain itself, or rather are connected with it by anastomotic fibres. The nerves animating the muscles which concur in the production of speech, for instance, take their origin in the anterior lobes, or at least have necessary communications with them.

In 1848, M. Bouillaud read a second memoir before the Academy, entitled, *Nouvelles Recherches*, etc., in which the number of cases in support of his views amounted to many hundreds. He then offered a premium of five hundred francs for any case of loss of speech without lesion of the anterior lobes.

The question of the localisation of the intellectual faculties, and especially of the faculty of speech, made, nevertheless, but little progress until 1861.

In February, 1861, a communication to the Anthropological Society of Paris by Dr. Gratiolet, relative to the signification of the volume of the encephalon, gave rise to long and interesting discussions on the volume and form of the brain, and on the principle of cerebral localisation. Dr. Auburtin, a pupil of M. Bouillaud, chiefly confined himself to the faculty of language, and considered that its seat in the frontal lobes, as sustained by M. Bouillaud, was abundantly proved both by traumatic cases, which may be considered as so many vivi-sections, and by pathological cases. He knew of no case of the destruction of both frontal lobes and the preservation of speech. He was ready to renounce the doctrine of M. Bouillaud should such a case occur. He alluded to a patient named Bach, in the Hospital for Incurables, who had lost his speech, but preserved his intelligence. This man was dying, and he diagnosed a softening of the anterior lobes; if these should be found in a condition of integrity, he would give up his opinion. The autopsy of this patient showed a lesion of

the third frontal convolution of the left anterior lobe. Dr. Broca was at that period still sceptical as regards special localisation; for we find him, at the sitting of the Anthropological Society, May 2nd, 1861, thus expressing himself:—

"I have at the last sitting shown you the brain of a man in whom a lesion of the frontal convolutions had abolished speech (the brain of Tan, see cases). It was a curious coincidence that this case occurred at the time when MM. Gratiolet and Auburtin carried on a discussion on the faculty of speech. But although I am rather inclining towards the opinion of M. Auburtin, I had no intention of taking part in the debate. I am neither for nor against special localisations. I merely try to lay down a general principle in considering the convolutions, not separately, but by groups, or, if you like, by regions."*

From this period Dr. Broca omitted no opportunity of investigating this subject, until he arrived at the conviction that the principle of localising the faculty of speech in the frontal lobes was correct in the main. He went further, and not only placed the faculty of speech in the left hemisphere, but restricted the limits of this faculty to the posterior half of the third left frontal convolution. Thus M. Broca became the chief exponent of the doctrine which now agitates not only Anthropologists but the scientific public generally.

What induced M. Broca to confine the lesion to the left hemisphere, and to the third frontal convolution, had better be stated in his own words used at a sitting of the Paris Anthropological Society, April 2, 1868:—

"I communicated to the Anatomical Society a case of loss of speech, which I call *aphemia*, in which the lesion occupied the third left frontal convolution. Soon after, I dissected an old aphemic subject who, during his life, had only five words at his disposal. We found an old hemorrhagic focus about two centimetres from the posterior extremity of the third left frontal convolution. Since that time M. Charcot had three aphemics whose cerebral lesions were exactly in the same spot. M. Gubler presented a similar case to the Biological Society. But here are two very important cases.—M. Charcot presented to the Biological Society a brain of an aphemic in which, as he stated, the lesion was in the parietal lobe. I confess I was rather startled, but when I dissected the membranes I found that the softening ran along the fissure of Sylvius and reached the third convolution, which is destroyed in its lower half. M. Duchenne (de Boulogne) told me one day that there was a case under Dr. Trousseau, in the *Hôtel Dieu*, opposed to my idea of the seat of articulate speech. I went to the hospital and found indeed the parietal lobe diseased; but on introducing the scalpel into the third convolution I announced that a lesion would be found, and effectually the convolution was found altered to

* *Bulletins de la Société Anthrop. de Paris*, 1861, p. 320.

the extent of three centimetres. Here then are eight cases in which the lesion was in the posterior third of the left frontal convolution, which appear to me sufficient to afford strong presumptive evidence in favour of my theory. I nevertheless await new facts."*

The most powerful adversary in France of Gall's Organology was unquestionably M. Lelut. In his treatise entitled *Qu'est-ce que la Phrénologie* (Paris, 1836), and in that bearing the title *Rejet de la Phrénologie*, published in 1843, he stigmatises phrenology as a pseudo-science. It is not a little remarkable that in this second work M. Bouillaud's name is not even mentioned. It is the usual, and perhaps commendable, practice to appoint a committee to report on a paper, and to select members holding different opinions on the subject-matter. We are, therefore, not surprised at the election of M. Lelut to serve on that committee, but we agree with him that holding such decided and *unalterable* opinions on the subject in question he ought, perhaps, to have declined the task.

Discussion in the "Imperial Academie de Médecine." Sitting of Dec. 6, 1864.—The Academy having charged MM. Bouillaud, Beclard, and Lelut to report on a treatise, entitled "Observations tending to prove the constant Coincidence of Speech disorders with Lesions of the Left Hemisphere,"† M. Lelut said that he regretted that the Academy had imposed upon him this task, which he ought to have declined. There are many points in physio-psychological science on which he was quite ready to modify his opinion, but there are some points on which his opinions could never be changed or modified. Of these are the relations which it is attempted to establish between certain mental faculties and certain parts of the nervous centre, and amongst these the attribution of the faculty of language to some part of the nervous system. This is neither more nor less than phrenology, and he had paid too much attention to this pseudo-science to recur to it. Such being the case, he would only speak in his own name, leaving it to his colleagues to express their own opinions separately. Dr. Dax, it appears, had collected about one hundred and forty cases, nearly all not of his own experience, in which speech disorders were always found connected with some lesion of the left hemisphere; the lesions of the right hemisphere producing no disorders of this kind. If such a fact were true, then the brain—that mysterious organ—would be still more mysterious. Dr. Lelut concluded by citing what he called

* "Bulletins de la Soc. d'Anthropol.," tom. iv, p. 202, 1863.

† "Observations tendant à prouver la coincidence constante des derangements de la parole avec une lésion de l'hemisphère gauche du cerveau," par Dr. G. Dax. Bulletins de l'Academie Impériale de Médecine," tom. xxx, Nos. 14 & 15, Avril 15 et Mai 15, 1865.

a very magnificent fact (*bien magnifique*), that of an epileptic in whom the whole left hemisphere was reduced to a pulpy mass, and whose speech was free to the moment of death.

M. Bouillaud, alluding to the "*fait magnifique*" cited by M. Lelut of the reduction of the whole left hemisphere into a pulpy mass, which lesion was not as much as suspected during life, said that such "magnificent facts" were nothing but the negation of all physiological and pathological science. They are open to great doubts, and may be considered as pseudo-facts. He would now, as M. Lelut has done, make his profession of faith in the following terms:—

"My experiments on living animals and my clinical observations have only enabled me formally to pronounce an opinion on two localisations proposed by Gall.

"1. The localisation of the faculty of language and of the faculty of articulate speech in the anterior lobes of the brain.

"2. The localisation of the generative faculty, or of the instinct of generation, in the cerebellum."

He had not only, as Gall has done, studied the purely intellectual element of speech, but also the mechanical element superadded to the former—viz., the movements requisite for articulate speech. After being convinced that the *co-ordinating* or legislating principle (*principe co-ordinateur ou legislateur*) of these movements had its seat in the anterior lobes of the brain, he followed up his researches, applying them to the *intellectual element* of speech, and he found that this element also had its seat in the anterior portion of the brain. It was then that in the title of the memoir which he published on the subject in question, he announced that his researches confirmed the doctrine of Gall on the seat of articulate speech and verbal memory.

As regards the second localisation of the instinct of generation in the cerebellum, he had always rejected it, whilst respecting the fundamental principle of the plurality and speciality of the cerebral organs.

Dr. Bouillaud concluded his discourse in the following terms:—

"The simultaneousness of the lesions of the faculty of speech and of reading and writing, which is not uncommon, induces me to think that the seat of the principle of these faculties must be a near neighbour of the faculty of speech.

"It may be said that cases contradictory to ours as regards localisation have been brought forward. No doubt of it; but we have weighed these cases, and we have found that none of them unite the conditions of a *well observed* case.

"For twenty years past we have offered a prize of five hundred francs to the author of a *well conducted* observation of a contradictory kind, but no one has claimed the prize. Let our opponents offer a prize of five hundred francs for a *well conducted* observation of a lesion bearing exclusively on the anterior lobes of the brain, and they will

not have to wait twenty years before there will be many claimants for the prize."

Here it is necessary to observe that Dr. Bouillaud takes his stand on the following propositions—viz., that the act of speaking presents two distinct phenomena—the faculty of creating words, and the power of co-ordinating the movements necessary for articulation. It is this latter faculty which he calls *pouvoir legislateur de la parole*, which he places in the anterior lobes of the brain. He says nothing about confining the organ of this faculty to either of the hemispheres, nor to any particular convolution of the frontal lobes. All subsequent efforts, especially those of M. Broca, were chiefly directed to circumscribe and better to define the limits of the cerebral organ of speech.

In the discussion at the Academy, April, 1865, M. Trousseau said :—

"We are not here to discuss either the doctrines of Gall or of Bouillaud, but a Memoir of Dr. G. Dax, son of Dr. Marc Dax, in which he endeavours to prove the constant coincidence of speech disorders and lesion of the left hemisphere. . . . . .

"What is the symptom or the *ensemble* of symptoms which I call *aphasia?* I shall at once put myself at ease by refusing to give a definition. I know nothing, in fact, more difficult than to give a good definition. . . . . .

"The aphasic is often paralysed, most frequently on the right side, so that we might believe that gesture and speech are obstructed by paralysis. Nothing of the kind. The man struck with hemiplegia who is not aphasic stutters; but he can still express his thoughts, although in an imperfect manner. He can write and draw, although badly. I call him an aphasic in whom the signs of thought cannot manifest themselves (*celui chez lequel les signes de la pensée ne peuvent plus se manifester*)."

Dr. Trousseau concluded as follows :—

"After what I have stated, it seems to me that we might arrive at the conclusion that aphasia is not a disease, but a symptom; that this symptom results nearly always from the perturbation of the various faculties of the intellect, especially of memory and attention. Numerous well observed cases equally authorise us to conclude that various regions of the encephalon concur to the formation of language, although the anterior lobes of the brain take the greatest part in it."

I have been unable to procure this memoir of Dr. G. Dax which gave rise to the discussion before the Academie. He refers in it to a treatise written by his father, Dr. Marc Dax, of Sommières, and read before the Medical Congress held at Montpellier in the year 1836. The title of the treatise was *Lésions de la moitié gauche de l'encephale, coincidant avec trouble de la pensée.* In his own memoir Dr. G. Dax sustains not merely that the lesion in the loss of articulate speech is

always in the left hemisphere, but he limits the lesion to the anterior and external portion of the middle lobe, namely to the region adjoining the insula and the posterior part of the third left frontal convolution. In justice to M. Broca, who has been blamed for not mentioning Dr. Marc Dax, who, as asserted by Dr. George Dax, had long ago maintained that the lesions which destroyed the faculty of language had their seat in the left hemisphere, and that a paper to this effect had been read before the Medical Congress, held at Montpellier in 1836, we extract the following passage from Dr. Broca's brochure* :—

"I desire that it may no longer be believed that I sinned either from ignorance or from wilful neglect. The existence of the memoir of M. Dax, senior, was as little known at Montpellier as it was in Paris. After vainly searching the journals of 1836 for some account of this memoir, I requested M. Gordon, the librarian of the Faculty of Montpellier to institute inquiries. M. Gordon was not more fortunate than myself. The congress held its last sittings at Montpellier from July 1 to July 10, 1836. The *Revue de Montpellier* (1836, I, II) gives an abstract of the subjects discussed; but the question of language is not mentioned. M. Gordon personally inquired of twenty physicians then resident at Montpellier; but they knew nothing of such a memoir having been read. I will not, however, deny the authenticity of the said memoir; for it may have been written for the congress, although not read. I merely wish to state that I could not guess the existence of a manuscript which has only been disinterred two years after my first publication on Aphemia."

[*To be continued.*]

Anthropological News.

In the course of a few days will be published a work, by Dr. C. M. Ingleby, a gentleman well known for his contributions to Elizabethan criticism, bearing the somewhat indefinite title of *Introduction to Metaphysics*; it will be sold by Mr. Ayres (the Clerk of the Royal Society of Literature) at No. 4 St. Martin's Place, Charing Cross, in consequence (as we hear) of a disagreement between the author and his publishers. We have seen the table of contents of this work, which are very comprehensive, and of the greatest interest. It is somewhat difficult to state in a few words the exact drift of this book. It is intended to be introductory to a work to be called by the somewhat peculiar name of *Material Logic*. The Introduction comprises a sketch of the principal psychological problems which concern perception through the senses, and the functions of the intellect. Dr. Ingleby grounds himself on Kant, and is evidently so ambitious as to dream of a fresh outcome from the critical philosophy, distinct from those of Fichte and of Hegel. He seems to have carefully criticised the systems of Reid, Berkely, Kant, Hamilton, and J. S.

* "Sur le siège de la Faculté du langage articulé." (Paris, 1865).

Mill. In the first book he utilises the recent discoveries and inventions in optics, especially those relating to binocular vision. The second book appears to contain an exhaustive account of analytical and synthetical judgments, and a thorough investigation of great principles of substance and accident, cause and effect, action and re-action; showing how the laws of nature (as the laws of motion) flow directly from those principles. Dr. Ingleby seems to be aiming at the determination of a great central idea, of which materialism, spiritualism, necessitarianism, and free-will are equally true and, we suppose, also equally untrue. It is plain that if such a work be executed with adequate power and knowledge, it will be a most valuable gathering up into unity of many details of knowledge which have hitherto failed to contribute to the great work of philosophy.

The Nova Scotian Giantess.—A correspondent had the opportunity of inspecting this remarkably large female during the exhibition at the Egyptian Hall, and forwards the following notes:—The placards at the street corners represent Miss Anna Swan as being 8 feet 11 inches high, and the exhibitor describes her as nearly 8 feet. The observer, who is 5 feet 10½ inches high, stood by her side, when his head reached exactly to the acromion process of her scapula. He estimates her height at about 7 feet 4 or 5 inches, certainly not more. The head, although absolutely large, is relatively to the bulk of the body small. Its contours closely resemble those of the microcephale Margaretha Maehler, figured on pl. xix of Carl Vogt's *Mémoire sur les microcephales*, only on a much larger scale. The frontal bone is depressed, and the superciliaries are large. The muzzle is protruding, and under the chin is a large development of adipose tissue, forming a double chin. The hand is spatulous; the fingers short and subequal in length. The mammæ are projecting, and the feet are large. The voice is low, and the gait ricketty. The specimen is less interesting than the much larger Chinese giant, Chang, which was exhibited some years ago at the Crystal Palace.

Archaic Anthropology in Ireland.—At a meeting in the Museum of the Naturalists' Field Club, Belfast, on the 4th March, a paper was read by J. S. Holden, M.D., F.A.S.L., of Glenarm, on "Archaic Anthropology." He stated that the object of anthropology was not to prove the ape origin of man, as was generally supposed, but to study the natural history of man as he was and as he is. Its present position resembles astronomy and geology in their early days, when they had to battle against popular prejudice and hereditary lines of thought, and like them will triumph. Palæontology has revealed, that the past life on our globe evidences an orderly succession and progression in the arrival of its numerous species, more an ideal than a perfectly continuous lineal series, as many blanks occur in the gallery of nature, "missing links" which may or may not be recovered. Yet there are enough facts to prove the transition from species to species, as the law of the animal kingdom. How does this law operate? is man's legitimate inquiry, and, as no law of nature is revealed, it must be sought for in nature itself; and, just as Kepler pursued the planets through many circles and curves before he discovered their true elliptic orbits, so many theories will be exhausted before the secret law controlling animal series is arrived at. The doctrines of transcendental anatomy first brought forward by Oken and Gœthe, that all animals are formed on one great plan, was accepted by Cuvier, and elucidated by Owen, while Darwin, to explain the continuity of the plan, started the bold theory of natural selection. Given unlimited time, the first created animal or prototype, developed into every phase of life, crossed the impass-

able chasm between the vertebrata and invertebrata, and ever evolving upwards, rolled through fish, rodent, and monkey into man. The anthropologist accepts Darwin's facts, but not all his fancies. Man's place in nature, when viewed anatomically, is certainly next door to the anthropoid apes, still we do not fancy the relationship. We claim the Bosjesman, but we repudiate the gorilla. He has not our opposable thumb; his eye-teeth are like tusks, and his brain is not half the size of that of the little Bosjesman. It is quite possible that some thousands of years ago the distance between the lowest man and the highest ape was less than it is now, as forms of both have become extinct. It is a singular fact that the large apes of Asia, as the orang, and the large apes of Africa, as the gorilla and chimpanzee, differ from each other by the same characters which distinguish the men of these two continents, viz., colour and cranium. The orang is brown and round-headed, like the Malay. The gorilla and chimpanzee are black and long-headed, like the Negro; yet it does not follow that Darwinism should come in and allow these apes to climb to the top of our ancestral tree. Referring to the antiquity of man, Dr. Holden said marks of his presence are found prior to the glacial period, as flint implements and weapons in the Upper Pliocene beds, and even some traces have been discovered in the Miocene. During the Quaternary period he was contemporary with the extinct mammoth and cave bear, and has, to our surprise, left us, in the *débris* of caves in France and Belgium, carvings and sketches of the reindeer and other departed animals much superior to the crude designs on Celtic monuments of a vastly later date. Dr. Holden gave a description of the earliest human crania (inferring the savage condition of man in the mammoth and reindeer periods), also of the Danish kitchen middens, tumuli, the Swiss lake dwellings, and the late researches among the long and round barrows of England. In conclusion, he showed that the three great race types of the present day were linked with the distant past. The black, yellow, and white, or Negroid, Turanian, and Caucasian. The Negroid type representing man of the Palæolithic age, distributed over South Africa and parts of Polynesia, at a time when those remote lands formed one continuous tropical continent—if this be so, this primitive type is of an antiquity so vast as to confound calculation. The Turanian—a higher race—probably drove the last to the south, afterwards to be driven itself from Europe to the north and east of Asia. Archaic anthropology, though still in its youth, declares the vast antiquity of man. No more can the age of the human species be numbered by years, unless by years the geological strata and fossil fauna along with which man has left his remains can be reckoned. No more can the dawn of humanity be assumed as a golden age of virtue and intelligence, but as a stone age of barbarism and savagery. Nevertheless, man takes the highest place in the organic series of progression, subject to the inexorable laws of nature. As on the vast ocean of time successive waves of types and species have risen and fallen, have come and gone, so man has appeared, lived, and disappeared; race has followed race, and races, like species, have their day and no more. We see the dark races of the world declining before the exterminating march of civilisation; the Caucasian is now dominant—for how long? Past analogy may indicate the future; and nature seemingly—

> "So careful of the type; but no!
> From scarped cliff and quarried stone,
> She cries—'a thousand types are gone,
> I care for nothing, all shall go.'"